



Milburnie Dam Tier 2 Sediment Sampling and Evaluation Report

February 2012



U.S. Fish and Wildlife Service
Ecological Services
Raleigh, North Carolina

Preface

The U.S. Fish and Wildlife Service coordinated an assessment of the chemical contaminants in, and toxicity of, sediments within the impounded reach upstream and downstream of Milburnie Dam on the Neuse River, North Carolina. The work was coordinated by Tom Augspurger (Ecologist / Environmental Contaminant Specialist) and Sara Ward (Ecologist / Environmental Contaminant Specialist) in the U.S. Fish and Wildlife Service's Raleigh Field Office.

Toxicity tests were performed by the U.S. Geological Survey's Columbia Environmental Research Center (CERC) under the direction of Chris Ingersoll. Other CERC scientists primarily responsible for the toxicity testing or in the preparation or characterization of elutriate or pore-water samples for the project were Nile Kemble and Jamie Hughes. Adam Riggsbee of RiverBank Ecosystems assisted with sample site selection during a field reconnaissance. John Rudolph with K2 Design Group assisted with sample collection. Analytical chemistry was performed by Environmental Conservation Laboratories, Inc. All chemical analyses were funded by Restoration Systems, LLC.

This revised report follows a September 28, 2011 draft which was circulated for review and comment. Comments received from the U.S. Geological Survey's CERC, the North Carolina Wildlife Resources Commission, the North Carolina Division of Water Quality, and RiverBank Ecosystems have been addressed in this final report.

Questions, comments, and suggestions related to this report can be directed to the U.S. Fish and Wildlife Service at the following address:

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Cover: Milburnie Dam, Neuse River, Wake County, North Carolina (USFWS photo)

Suggested citation: Augspurger, T. 2012. Milburnie Dam Tier 2 Sediment Sampling and Evaluation Report. U.S. Fish and Wildlife Service, Ecological Services, Raleigh, NC.

Milburnie Dam Tier 2 Sediment Sampling and Evaluation Report

Executive Summary

This report documents a characterization of sediments collected from upstream and downstream of Milburnie Dam on the Neuse River in Wake County, central North Carolina. Six whole-sediment samples from within the impounded reach and four from downstream were collected in August 2011. All samples were analyzed for elemental contaminants and polycyclic aromatic hydrocarbons (PAHs). Elemental contaminant concentrations in whole-sediments were not of toxicological significance; only zinc at one site marginally exceeded freshwater sediment threshold effect concentration (TEC) screening values. One or more sediment PAHs with freshwater sediment screening values exceeded the conservative TEC screening values at three of the four sites downstream from the Milburnie Dam, but none of the sites upstream of the dam exceeded these conservative TEC screening values. Consistent with the low concentrations of elemental contaminants in the whole-sediments, no elemental contaminants in pore-water samples extracted from sediments exceeded State water quality standards or action levels. In 2-d sediment elutriate (water-extractable fraction) tests with *Ceriodaphnia dubia* (freshwater cladoceran), survival ranged from 80 to 100% in elutriates made from sediments taken upstream of the dam and 70 to 100% in elutriates made from sediments taken downstream. Total lead and copper in the unfiltered elutriates exceeded State water quality standards, but concentrations in elutriates from the six upstream samples were not statistically-different than those from the four downstream sites. In two filtered elutriate samples, the dissolved copper and lead concentrations were less than the State standards. While the elutriate results are an indication that mobilization of sediments by re-suspension may be a short-term water column concern for total copper and lead, the concentrations of copper and lead are unlikely to be of toxicological concern based on the filtered sample results and based on the lack of toxicity observed in the elutriate toxicity tests. The lower quality of downstream sediments, as indicated by higher PAHs in whole sediment and the maximum elutriate lead and copper concentrations, suggests the proposed dam removal is unlikely to increase long-term pollutant exposure downstream of Milburnie Dam. Therefore, the existing chemical and toxicological data should be sufficient for dam removal planning and sediment management planning without conducting additional toxicity tests with whole-sediment samples.

Background and Site Selection

Milburnie Dam is about 13-feet tall and creates an impoundment on the Neuse River in Wake County, central North Carolina. The dam has a small, now-defunct, hydroelectric plant and the watershed is relatively undeveloped immediately upstream but extensively developed (US1 and US401 corridors) further upstream (Augspurger and Ward 2008). With the removal of Milburnie Dam under consideration, the U.S. Fish and Wildlife Service (Service) coordinated a Tier 2 sediment evaluation within and downstream of the impounded reach.

Factors considered in determining the number and location of samples included the information from a Tier 1 survey (Augspurger and Ward 2008) and areas of sediment accumulation. Physical factors considered included the area and depth of potentially affected sediments behind the dam, physical properties of the sediments, distribution of sediments, and the length / breadth of the

impounded reach. In summer 2010, the Service recommended a physical characterization of the sediments to help pick potential sample sites and to determine sediment depths. Restoration Systems, LLC contracted with ENTRIX to conduct physical evaluation.

ENTRIX (2010) concluded that the impoundment substrate was dominated by sand and gravel; only 4 of the 38 areas they sampled were sites of fine-grained sediment (silt, clay, organic material) accumulation. Sites of fine-grained material accumulation are good targets for collecting samples for analytical chemistry because sand and gravel-dominated sediments have far fewer binding sites and less surface area and are therefore not as prone to sequestering contaminants (Horowitz 1985). A second reconnaissance was conducted on May 11, 2011 by staff with the Service and RiverBank Ecosystems. This was to confirm depositional areas identified in the ENTRIX report and assess areas not examined previously.

Similar to the results of the ENTRIX effort, no important depositional areas were identified during the May 2011 survey within the first river mile downstream of Buffaloe Road; the river is relatively straight in this section and sediments are dominated by sand. Sampling inside the first bends in the river downstream, near Riverbend Plantation, no substantive fine-grained material accumulation was noted along the right bank (site S25A on Figure 1) and less than two inches of fine-grained material on top of coarse sand was found along the left bank (site S24A). The ENTRIX finding of about 0.8-feet of fine material at site S22 was confirmed by the May 2011 reconnaissance; this same depth of fine depositional material was also observed along the left bank (site S21A, Figure 2). These deposits are not extensive; for example, there was less than three inches of fine-grained material on the inside of the next bend downstream (site S20A).

There is a small island in the Neuse River just west of Beaverdam Lake (and draining to the Neuse River). At the point where the lake enters the river (site S18A, Figure 3) fine-grained material in excess of one foot deep was observed. Just downstream of the island (site S17C), there was a small area of fine-grained material in the flow shadow created by the island. There was no fine-grained material accumulation in the channel between the outlet of Beaverdam Lake and the tip of the island; the main channel sediments on both sides of the island were coarse sand and rock (sites S18 and S18B). ENTRIX identified 0.6-feet of fine to medium sand with some fines at site S13, at the outlet of the wetland complex south of the Hedingham development. The May 2011 reconnaissance documented that this area of deposits extended about 150-feet downstream; between sites 13 and 13A, 0.8 to 2.5-feet of fine-grained material was documented.

Along the right side of the river just upstream from the dam (site S2, Figure 5), ENTRIX reported 7.7-feet of fine particulate organic matter and muck. The May 2011 characterization at S2 and further into the channel (S2A) revealed loosely consolidated coarse particulate organic matter with silt and fine particulate organic matter interspersed; most of the samples at the surface were dominated by leaves, bark, sticks, and bigger woody debris. Just upstream (site 6 and S6A), greater than one foot of fine material was documented in a shoal; it is likely that this material is similar in nature to the fine material interspersed among debris at sites S2 and S2A with the advantage of being more practical to sample.

Downstream of the dam, there were fewer areas of accumulated fine sediments. Five areas (D1-D5, Figure 6) were confirmed as suitable reference sites for chemical characterization.

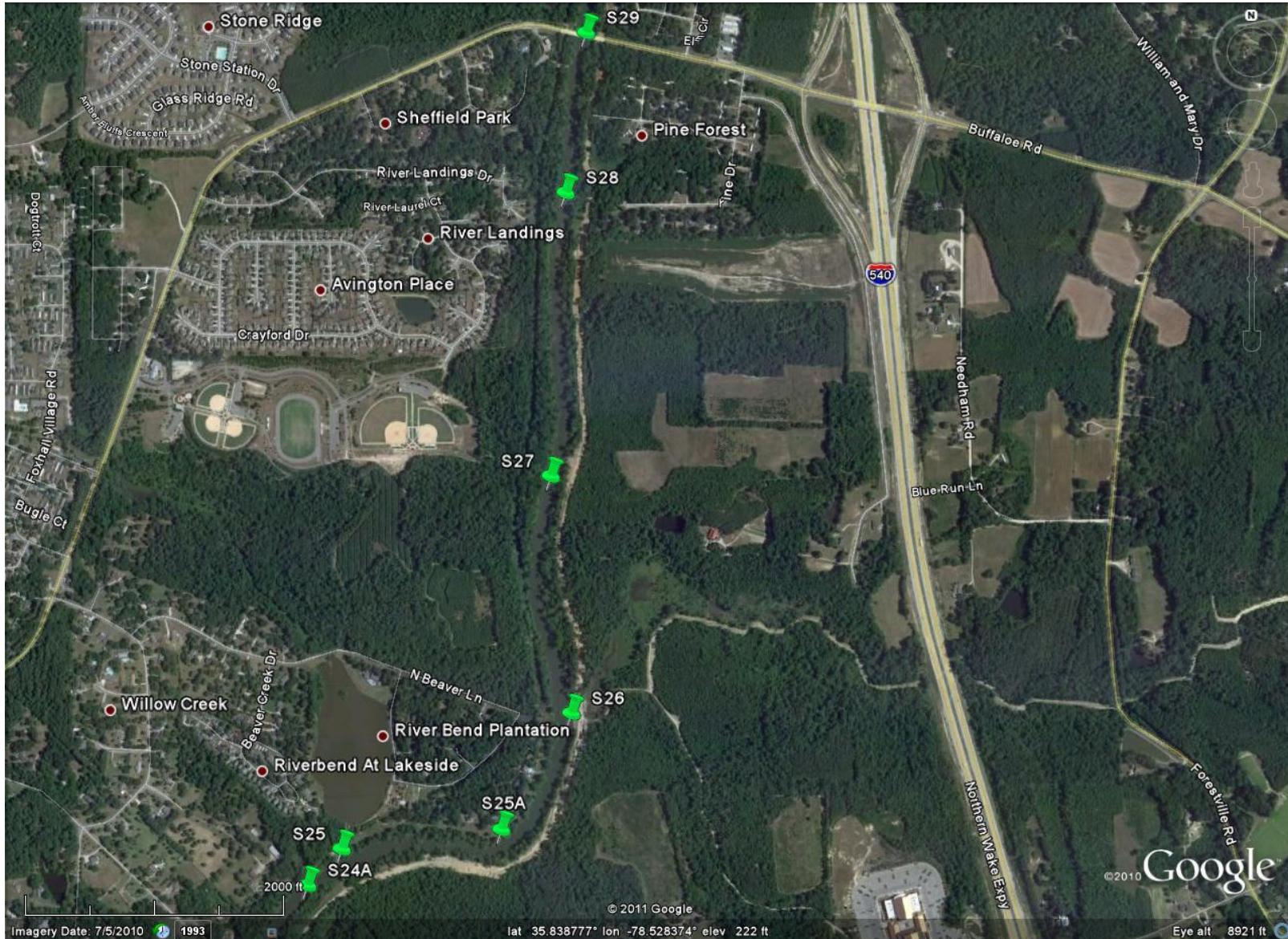


Figure 1. Neuse River from Buffaloe Road to River Bend Plantation. Pins note May 2011 sediment characterization sites most of which were also initially characterized by ENTRIX in 2010.

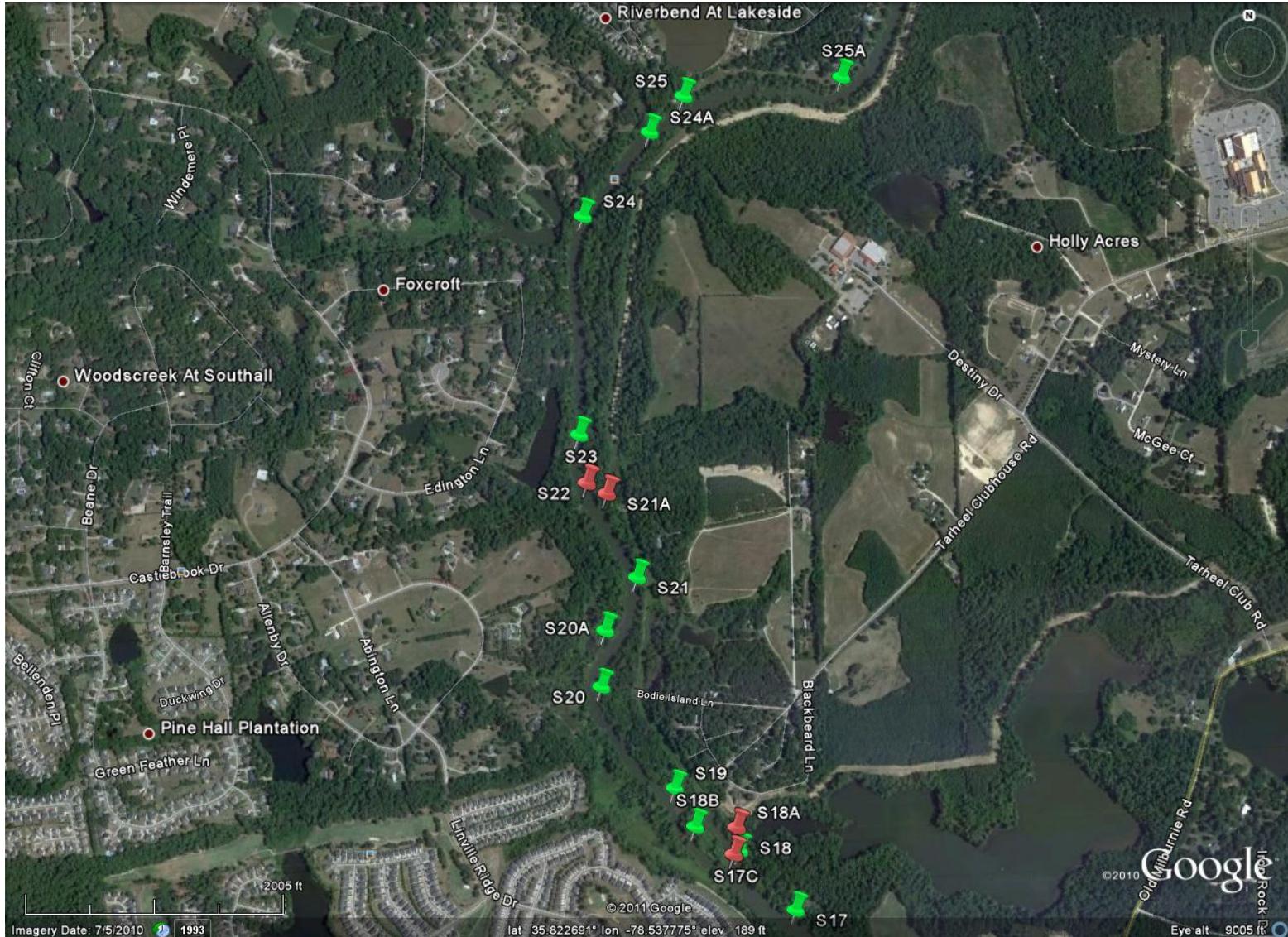


Figure 2. Neuse River from River Bend Plantation to Beaverdam Lake. Pins note May 2011 sediment characterization sites (most of which were also initially characterized by ENTRIX in 2010), with fine-grained depositional material in red and coarse material (sand, gravel, rock) in green.

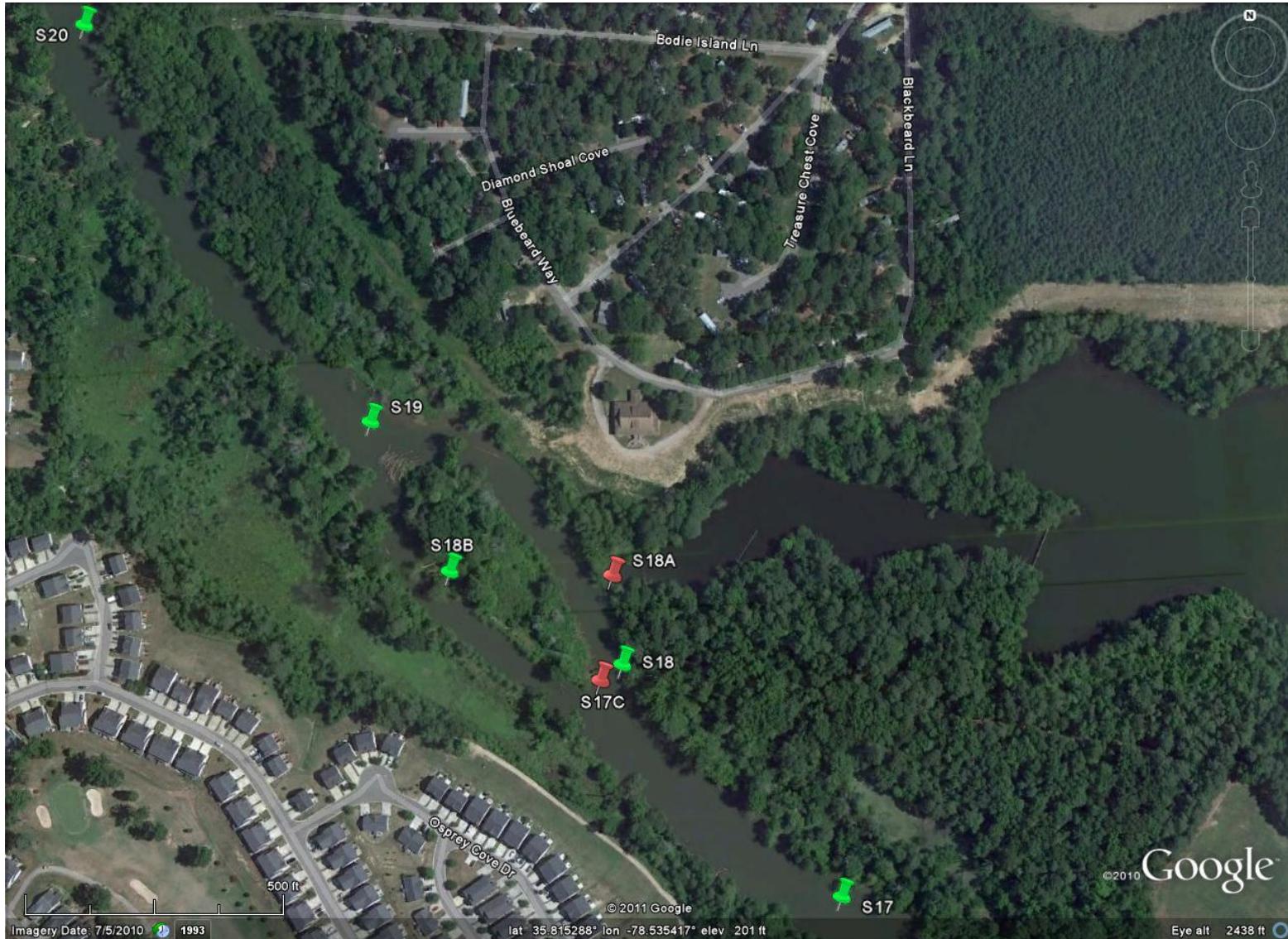


Figure 3. Neuse River near Beaverdam Lake. Pins note May 2011 sediment characterization sites (most of which were also initially characterized by ENTRIX in 2010), with fine-grained depositional material in red and coarse material (sand, gravel, rock) in green.

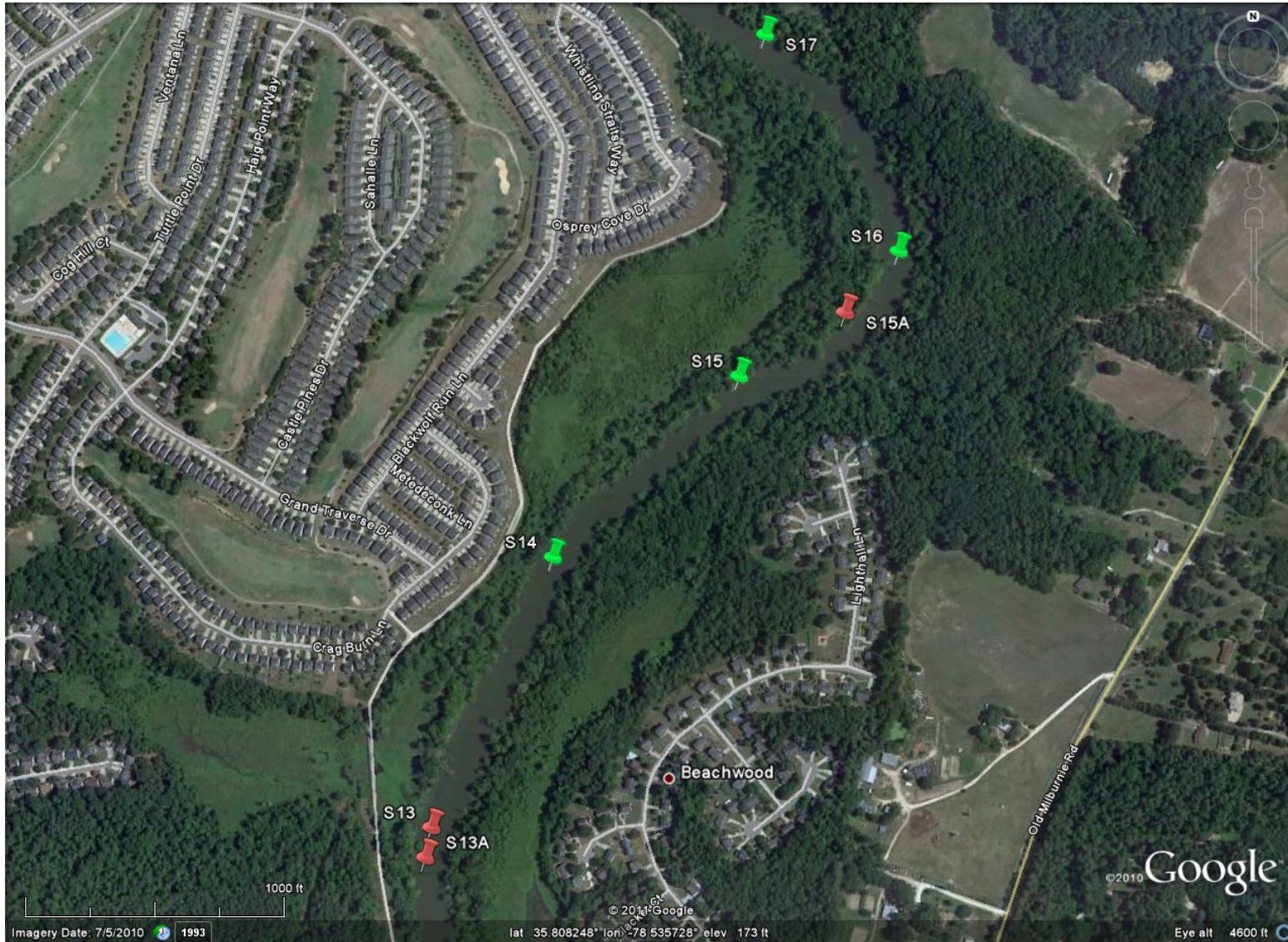


Figure 4. Neuse River from Beaverdam Lake to Hedingham wetlands. Pins note May 2011 sediment characterization sites (most of which were also initially characterized by ENTRIX in 2010), with fine-grained depositional material in red and coarse material (sand, gravel, rock) in green.

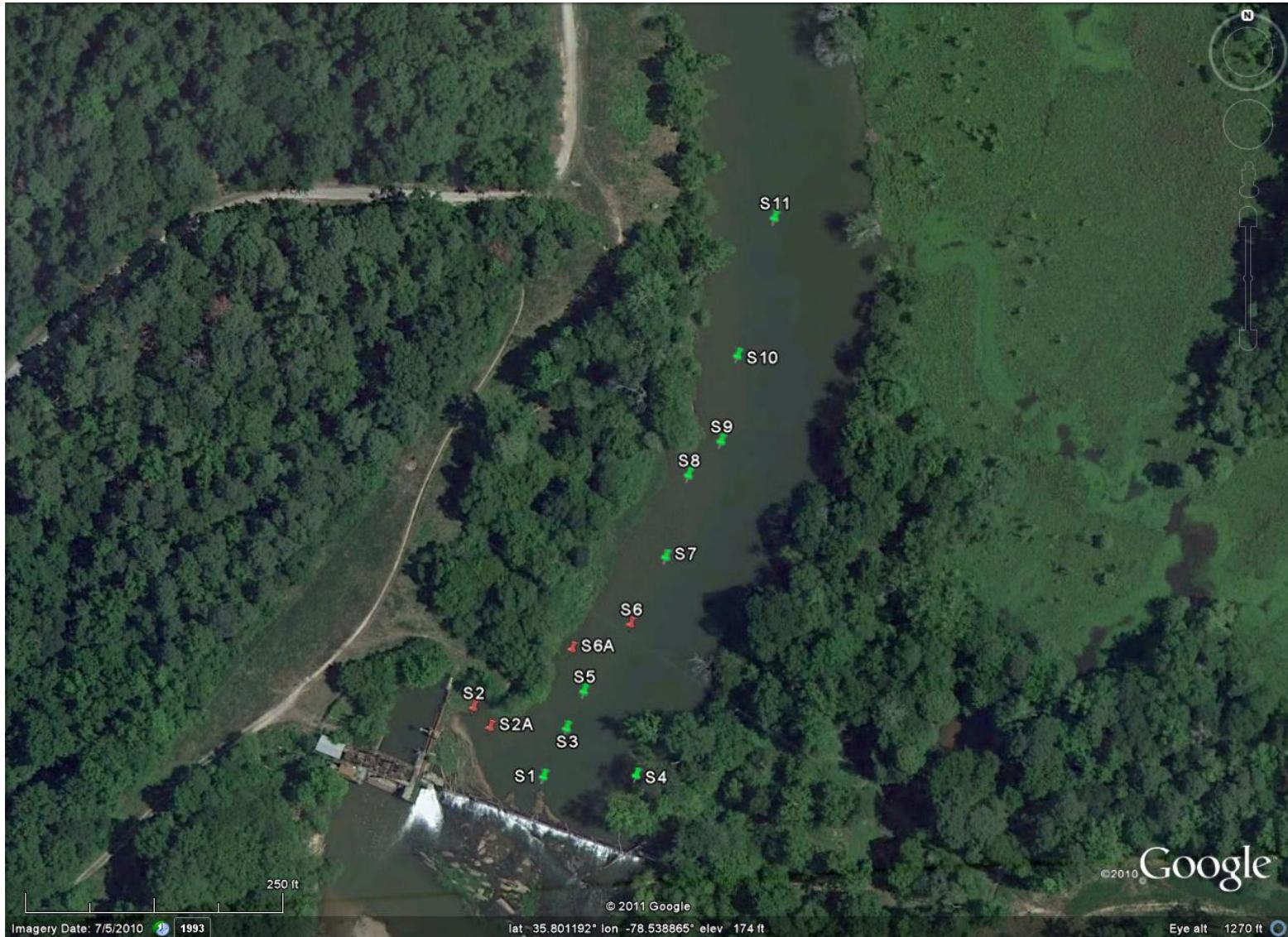


Figure 5. Neuse River upstream of Milburnie Dam. Pins note May 2011 sediment characterization sites (most of which were also initially characterized by ENTRIX in 2010), with fine-grained depositional material in red and coarse material (sand, gravel, rock) in green.

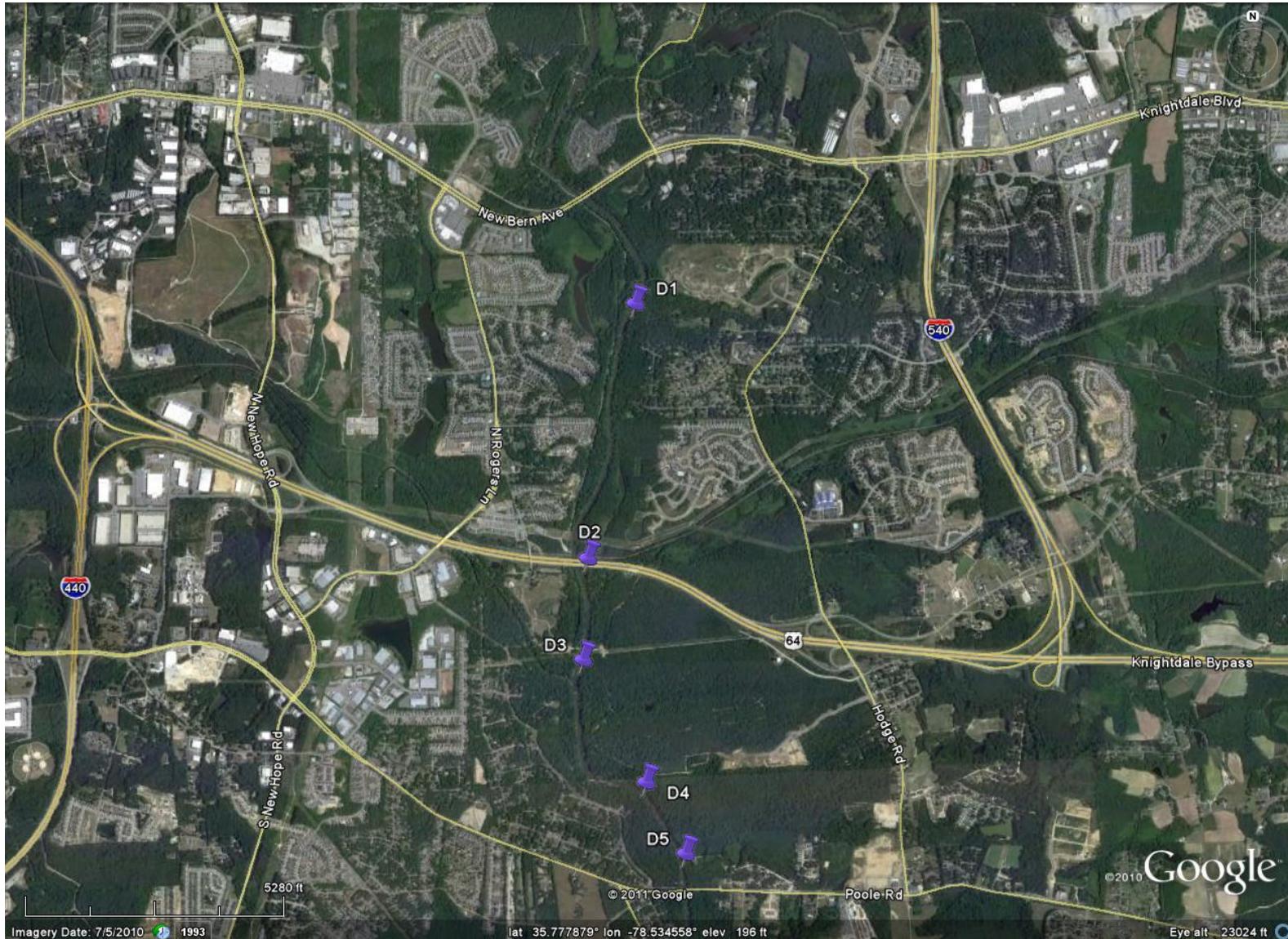


Figure 6. Neuse River downstream of Milburnie Dam. Pins note May 2011 sediment characterization sites with fine-grained depositional material as potential reference locations for comparison to sediments collected upstream of the dam.

We considered the most important sediment deposits to sample as those with accumulation of fine-grained material and those most likely to move downstream following dam removal. In most of the system, including deeper material under the areas of fine-grained material accumulation, sand and gravel are dominant based on the depth-to-refusal sampling (ENTRIX 2010). Our chemical analyses targeted areas of fine-grained material accumulation; these are thought to be a near worst case scenario with regard to contaminants based on the affinity of fine-grained sediments to bind contaminants and the small percentage of fine-grained sediments in a system dominated by coarse-grained material.

With regard to sediment movement, important areas to sample include those downstream of wetland complexes and close to the dam, both because fine-grained material was documented in these locations and because these sediments have the most potential to move downstream following dam removal (Adam Riggsbee, Riverbank Ecosystems, pers. comm. 2011). The proposed removal process would begin with a dewatering notch, placed in the dam on the left side (facing downstream). This is anticipated to create more of an eddy in the area near the powerhouse (near site S2 in Figure 5), where deeper unconsolidated sediments were found, lessening their significance as a downstream source of fine sediment. Adam Riggsbee (Riverbank Ecosystems, pers. comm. 2011) notes that the fine sediment accumulations upstream of this area along the same bank (near site S6, Figure 5) have more potential to move.

In addition to composition and potential to move, sample depth was considered in study design. Adam Riggsbee (Riverbank Ecosystems, pers. comm. 2011) notes that Milburnie is relatively ineffective at sediment trapping, as evidenced by the discovery of only a few fine sediment accumulations (ENTRIX 2010) all of which are relatively shallow deposits. This was expected based on the physical properties of the system: 1) the presence of Falls Lake Dam, which traps the majority of the watershed's fine sediment load; 2) the impoundment's morphology does not produce hydraulic conditions suitable for sediment trapping (narrow reservoir compared to free flowing channel widths); and 3) this trapping inefficiency means sediments are episodically exported and replaced during high discharge events (residence times are likely on the order of years, not decades). Also, the Neuse River experienced flows of record over the last 15 years with hurricanes in 1996 and 1999, particularly Floyd and Fran, which were probably capable of completely scouring, exporting and replacing sediment accumulations within the impoundment. The only area of deep unconsolidated sediments documented during the reconnaissance was the 7+ feet of material at site S2 dominated at the surface by coarse organic material. While it is unclear what is present lower in the depth profile at that location, this material is thought to be of relatively recent origin (based on flows in the area and the short height of the dam) and is unlikely to move during and after the removal based on the removal design, as described above (Adam Riggsbee, Riverbank Ecosystems, pers. comm. 2011).

We concluded that surface grab samples are likely representative of the entire depositional profile of fine-grained sediments for the areas sampled. While surface samples are only definitively characterizing the top few inches in the sampled areas, the nature of the sample material supports an inference that these are likely representative of worst case conditions for contaminant accumulation within the impoundment. Sample location and the expected pattern of sediment movement following dam removal further support an inference that these samples are representative of likely worst case conditions for contaminant mobilization from dam removal.

Methods

Sediment sample collection and storage

Sampling was conducted consistent with a plan circulated among various resource agencies for review in May 2011. A final sampling plan was developed August 1, 2011. Samples were collected August 11 and 12, 2011 by two Service contaminants ecologists (Tom Augspurger and Sara Ward) with the assistance of a surveyor from K2 Design Group (John Rudolph). Figures 7 through 9 depict collection locations; the coordinates of each sample are provided on individual site GPS-photo sheets in the appendices.

A stainless-steel petit Ponar dredge was used to collect the top 5 to 10 cm of sediment; multiple grabs were collected and composited to form one sample at each site. The composite of the grab samples was homogenized by stirring with a stainless-steel spoon in a stainless-steel bucket. Debris (e.g., sticks, leaves, rocks bigger than about 0.5 cm³) were physically removed during homogenization. Collection equipment was thoroughly cleaned (ambient water rinse, detergent and water scrub, distilled / demineralized water rinse, 10% nitric acid rinse, another distilled / demineralized water rinse, acetone rinse, and a final rinse with distilled / demineralized water) before sampling at each site. Wash-water was containerized in the field for proper disposal.

Aliquots of the homogenate were split into chemically-cleaned glass jars (provided by the analytical laboratory) with Teflon®-lined lids for chemical analyses with about 6 to 8 L of the same sediment homogenate from each site placed in two high-density polyethylene jars (EP Scientific Products, Miami, OK) for toxicity testing. Samples were stored in a cooler on ice (about 4°C) in the field. Upon reaching the Service lab in Raleigh each evening, samples were stored refrigerated (about 4°C).

Sediment chemical and physical analyses

Sediment samples were delivered to Environmental Conservation Laboratories, Inc. (ENCO) in Cary, NC on August 15, 2011. ENCO has the North Carolina Laboratory Certification for the requested analyses. Elemental contaminants and PAHs include many common pollutants and were targeted for analyses in all samples because they were identified as pollutants of potential concern in the Neuse River watershed upstream of the dam (Augspurger and Ward 2008). Additionally, these compounds have consensus-based freshwater effects sediment quality guidelines (MacDonald et al. 2000, USEPA 2000b) with which to evaluate the results.

Sediment samples were analyzed for Al, As, Cd, Cr, Cu, Fe, Pb, Mn, Ni, and Zn by USEPA method 6010B (inductively coupled plasma-atomic emission spectrometry, or ICP-AES). Analyses of mercury in sediment samples were by USEPA method 7471A (cold-vapor atomic absorption spectrophotometry). ENCO analyzed sediments for PAHs, including 1-methylnaphthalene, 2-methylnaphthalene, acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, fluorine, indeno(1,2,3-cd)pyrene, naphthalene, phenanthrene and pyrene, by USEPA method 8270C (gas chromatography / mass spectrometry, or GC/MS).

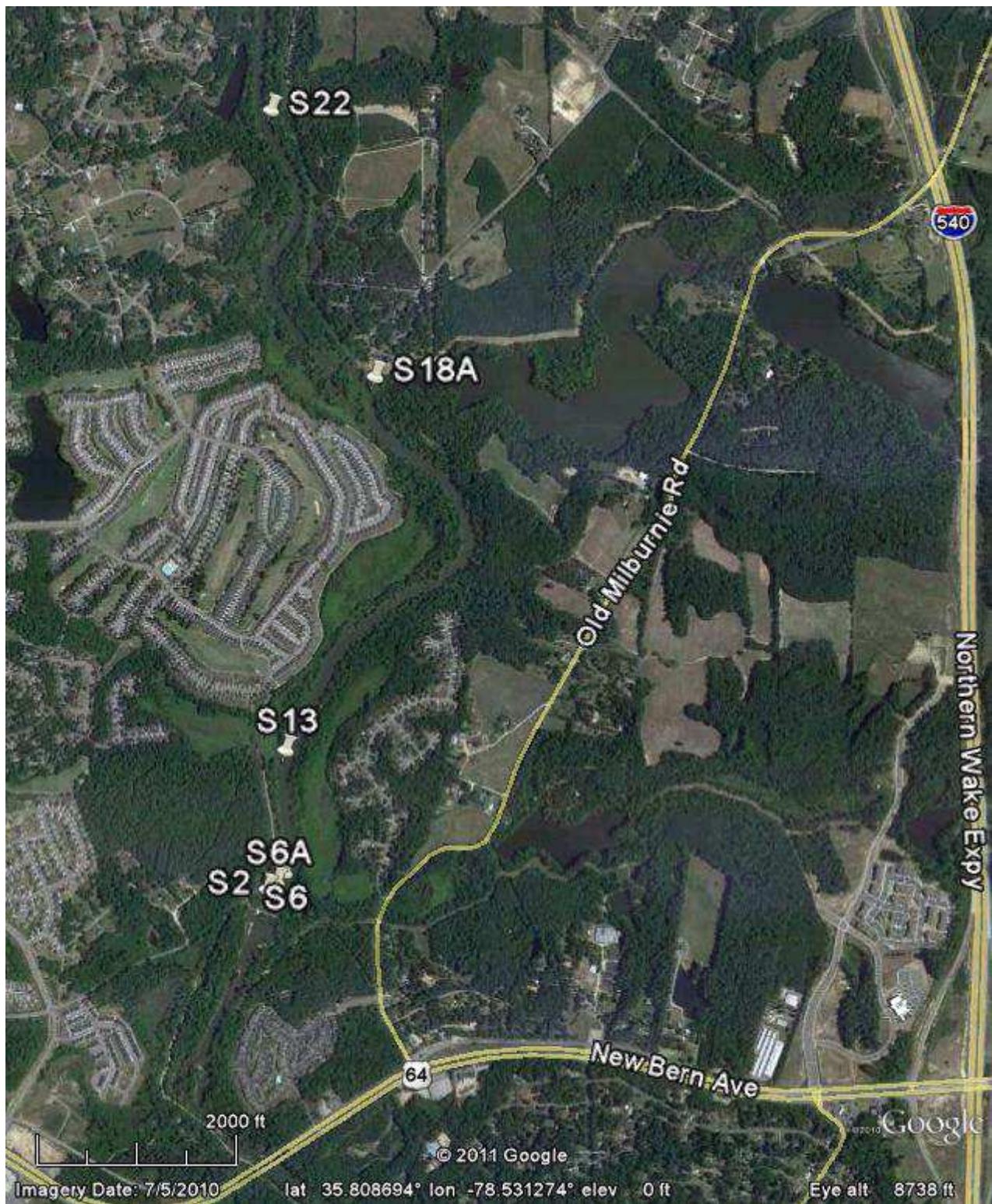


Figure 7. Milburnie Dam (Neuse River) impoundment sediment sampling sites. Samples sites associated with the area near the dam are enlarged on the next map.



Figure 8. Enlarged view of the sediment sampling sites nearest to Milburnie Dam.

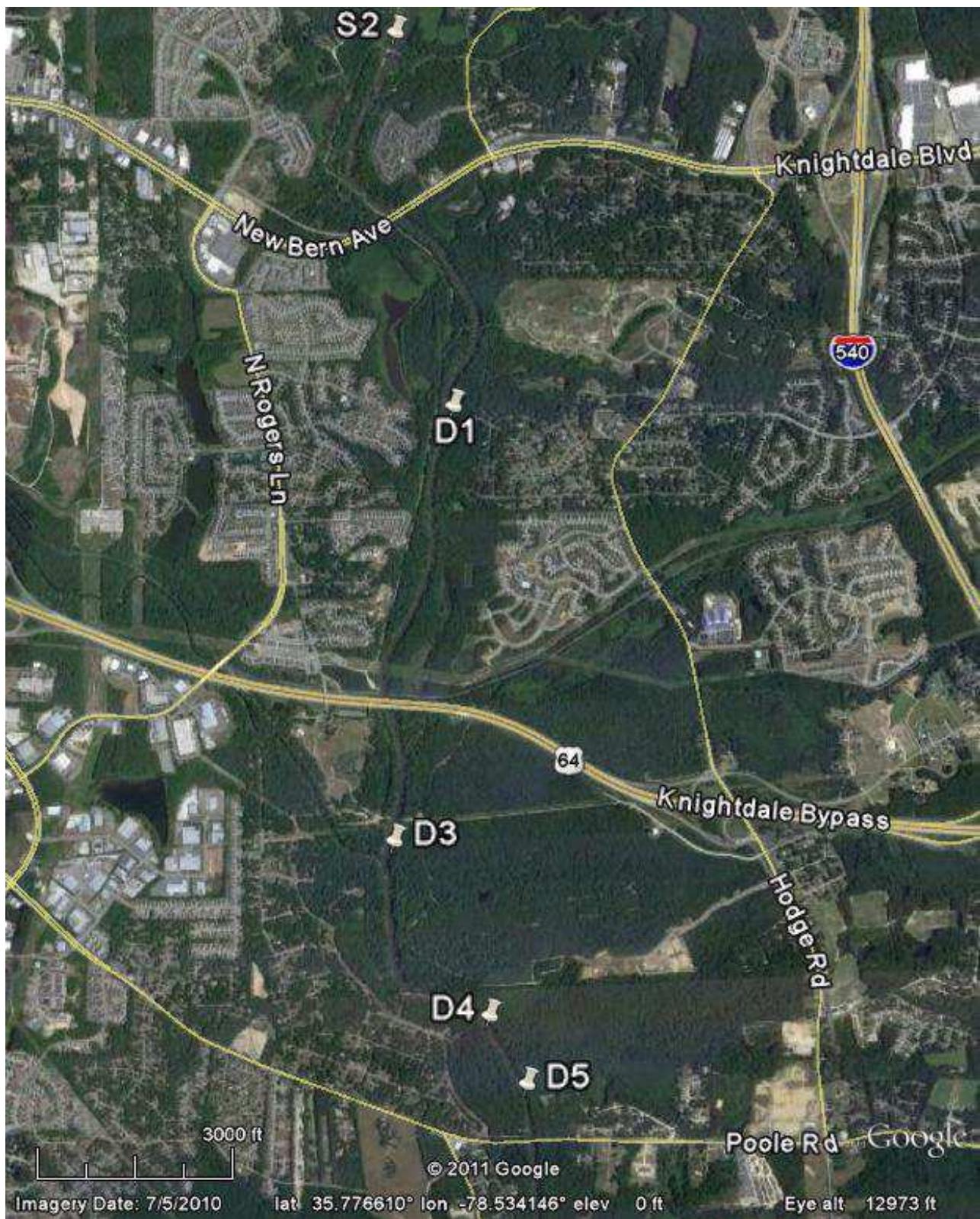


Figure 9. Neuse River sediment sampling sites downstream of Milburnie Dam (sample site S2, just upstream of the dam, is also shown for reference).

Physical characterization of whole-sediments included percentage water, particle size, and total organic carbon (TOC). Particle size analysis was conducted at U.S. Geological Survey Columbia Environmental Research Center (CERC), Columbia, MO by sieve series following methods described in Foth et al. (1982) and Kemble et al. (1994). The TOC analyses were done by ENCO with the Walkley Black method (Schumacher 2002).

All sediment analyses were accompanied by batch-specific quality control / quality assurance samples (blanks, spikes, and duplicates). Review of quality assurance data indicates acceptable precision and accuracy for all analyses. The laboratory blank sample for sediment analyses contained low levels of aluminum (3.75 mg/kg wet weight) and iron (2.2 mg/kg wet weight). Because the actual sample results were three to four orders of magnitude greater than those concentrations in the blank, the presence of these metals in the blank is of no concern in data interpretation. There was poor matrix-spike/duplicate sample recoveries for Al, Fe and Mn in sediment, but this was the result of low spike level relative to high concentration of these elements in sediment. The batch was accepted for these analytes based on the laboratory control spike recoveries. Results of duplicate sample analyses were within precision specifications for all analytes in sediment.

Pore-water and elutriate chemistry

About 6 to 8 L of each sediment sample was sent to CERC by overnight delivery on August 15, 2011. Pore-water and elutriate samples were prepared from sediments by CERC. About 100 ml of pore-water (the water from in between spaces among the sediment particles) was isolated from sediment samples by centrifugation at 5200 rpm (7000 x G) for 15 min at 4°C (Kemble et al. 1994). Elutriates (used to examine the water-available fraction of sediment pollutants) were prepared by CERC to examine the potential impact of short-term re-suspension of sediments into the water column. Elutriates were prepared following procedures in USEPA (1993). About 50 ml of sediment was placed into two 250-ml high-density polypropylene centrifuge tubes and topped off with 200 ml of water (100 mg/L hardness as CaCO₃ prepared as a dilution of CERC well water with deionized water). Hence, by volume, the elutriate samples were prepared at a ratio of 1 part sediment to 4 parts water. The tubes were then sealed and tumbled on a rolling mill for 30 min. The tubes were next centrifuged for 15 min at 5200 rpm (7000 x G). The overlying water was finally decanted through a US Standard #50 stainless steel sieve (300-µm opening) into a 500-ml beaker. A sub-sample of the elutriate samples was collected for water quality characterization, with the remaining sample used in toxicity tests (see below).

Two pore-water samples and two elutriate samples were split with one fraction filtered to provide a basis for comparing total recoverable metals (all samples) and dissolved metals (filtered samples). For the filtered samples, a 25-mm diameter polypropylene filter cartridge containing a 0.45-µm pore size polyethersulfone membrane was used (with a polypropylene fiber pre-filter for metals analyses and a glass fiber pre-filter for sulfide analyses).

Following pore-water extraction and elutriate preparation, all samples were analyzed for dissolved oxygen, pH, alkalinity, temperature, conductivity, total ammonia, and hardness using methods outlined in Kemble et al. (1994). Total dissolved sulfides were measured following a

1+1 mixing with sulfide anti-oxidant buffer and analysis by ion-selective electrode according to standards methods. Total organic carbon measurements in waters were by UV promoted, persulfate oxidation followed by colorimetric detection of CO₂ (similar to US EPA method 415.2) (Technicon Industrial Systems 1976, Ontario Ministry of the Environment 2010).

Pore-water and elutriate samples were shipped from CERC back to the Service's Raleigh Field Office on August 22, and we delivered them to ENCO for elemental contaminants analyses on August 23. Analytes included As, Cd, Cr, Cu, Pb, Ni, and Zn by USEPA method 200.8 (Trace Elements by ICP/Mass Spectrometry). This method was also used to measure Mg and Ca which provided another measure of hardness for these samples (by the calculation method in Standard Methods SM 2340B). All water analyses were accompanied by batch-specific quality control / quality assurance samples (blanks, spikes, and duplicates). Review of quality assurance data indicates acceptable precision and accuracy for all analyses. The laboratory blank samples for water analyses contained low concentrations of chromium (0.75 to 0.88 µg/L), nickel (0.11 to 0.16 µg/L), and zinc (0.47 to 0.51 µg/L). These concentrations are one to two orders of magnitude less than the actual samples, so the presence of these metals in the blank should not affect interpretation of results. There was poor matrix-spike/duplicate sample recoveries for lead, but this was the result of low spike level relative to the native concentration. The batch was accepted for lead based on the laboratory control spike recoveries. Results of duplicate sample analyses were within precision specifications for all analytes in waters.

Whole-sediment and elutriate toxicity tests

The study plan called for an examination of sediment chemistry data, pore-water chemistry data, and elutriate chemistry results as a screening step before deciding on the need for any toxicity testing of either whole-sediment samples with the amphipod *Hyalella azteca* or with the midge *Chironomus dilutus* or elutriate toxicity tests with the cladoceran *Ceriodaphnia dubia*. A decision point within about eight weeks of sample collection stays within the recommended holding times for the original samples (USEPA 2000a, ASTM 2011). A helpful addition to the proposed sequence was provided by CERC which conducted a preliminary 2-d toxicity test with the sediment elutriates (water-extractable fraction of the sediment) evaluating effects on survival of *C. dubia* (USEPA 1993). This provides an initial measure of biological effects of the samples.

Test organism culture - Cladocerans were cultured under static conditions in 30-ml disposable clear plastic cups each containing 15 ml of well water diluted with deionized water (final hardness 100 mg/L as CaCO₃) and one adult at a temperature of 25°C and a light intensity of about 200 lux (USEPA 1993). Cladocerans in each cup were fed 0.1 ml/d Yeast-Cerophyll-trout chow (YCT; 1.7 to 1.9 g/L) and 0.1 ml/d unicellular green algae (3×10^7 cells of *Selenastrum capricornutum*). Neonates (<24 hours) to start the tests were obtained from adults that produced eight or more young in their third brood or subsequent broods.

Elutriate test - Toxicity tests with *C. dubia* were conducted for 2-d in a modification of methods outlined in USEPA (1993) starting within a week of sediment collection. Elutriate samples were prepared as described above. The cladoceran test was started on Day 0 with

<24-h old *C. dubia*. The CERC used a single replicate of each elutriate sample (100 ml test water in a 300 ml beaker; 100% test solution with no dilution) with 10 organisms in the beaker. The control water was CERC well water diluted with deionized water (final hardness about 100 mg/L as CaCO₃). Cladocerans were maintained in a water bath at 25±1° C on a 16 h light: 8 h darkness photoperiod at a light intensity of about 200 lux. Cladocerans were not fed during the exposures. On Day 2, survival of the cladocerans was determined by pouring all the test water into a petri dish and using a light table to facilitate counting the neonates. Results are expressed as percent survival.

Data Interpretation

Elemental contaminants and PAHs in sediments are compared to ecological effects screening values developed and published by MacDonald et al. (2000). Pore-water chemistry data and elutriate chemistry data were compared to surface water quality standards and action levels (NCDENR 2007). While evaluating the samples against sediment and water quality thresholds is the focus, an upstream-downstream comparison of select pollutants was done with the nonparametric Wilcoxon rank sum test (Gilbert 1987). Statistical significance for these comparisons was based on $p<0.05$.

Results and Discussion

Whole-sediment analytical chemistry

Total organic carbon in the samples averaged 2.2% and the average percent fines (sum of silt and clay fraction) was 49% indicating depositional areas were located for the assessment (Table 1). Our samples were typically in shoaling areas close to shore where fine material, which has the greatest potential to sequester pollutants, had accumulated. These areas are not the norm (ENTRIX 2010) as most sediments upstream of the dam were coarse sand and gravel (which have little pollutant retention potential and were therefore not sampled).

There are no federal or North Carolina sediment quality criteria or standards, but the threshold effects concentrations (TECs) and probable effects concentrations (PECs) from MacDonald et al. (2000) are helpful in assessing the significance of the sediment chemistry results as we have done for previous projects (e.g., Augspurger et al. 2007). The TECs are concentrations of contaminants in whole-sediment below which adverse effects to sensitive aquatic organisms are not expected to occur; Milburnie Dam sample results less than the TECs are hence considered of no toxicological concern. The PECs are effect-based sediment quality guidelines established as concentrations of contaminants in whole-sediment above which adverse effects are expected to frequently occur in field-collected sediments (MacDonald et al. 2000); if sample results exceed these PECs, additional evaluation is warranted. The sediment guidelines we used have been the basis for standards and screening values elsewhere (MacDonald and Ingersoll 2002a, 2002b, MacDonald et al. 2003). Florida and Wisconsin recommend TECs and PECs for use as guidance in their programs, including evaluation of dredged material and risk assessment of contaminated sites (MacDonald et al. 2003).

No samples exceeded the PECs (Tables 2 and 3). For elemental contaminants, only zinc at one site (S13) marginally exceeded TECs; the measured concentration (151 mg/kg) is well below the geometric mean of the TEC and PEC for zinc (236 mg/kg) (Figure 10). Zinc concentrations in sediment from the six upstream samples were not statistically-different than those from the four downstream sites. All other metals were less than their corresponding TECs; because sample results less than these values are not expected to produce adverse effects to sensitive aquatic organisms, they are therefore considered toxicologically insignificant.

In the PAH analyses (Table 3), 1-methylnaphthalene (<30 µg/kg), 2-methylnaphthalene (<40 µg/kg), acenaphthene (<53 µg/kg), acenaphthylene (<31 µg/kg), anthracene (<42 µg/kg), fluorine (<30 µg/kg), and naphthalene (<30 µg/kg) were less than corresponding detection limits in all samples. No samples exceeded the PECs, and none of the samples collected from upstream of the dam exceeded the TECs. One or more sediment PAHs with freshwater sediment TECs were in excess of TECs at three of the four downstream sites. MacDonald et al. (2000) and USEPA (2000b) concluded that exceedences of PECs (by frequency or by magnitude) is frequently associated with sediment toxicity, but infrequent exceedences of TECs is not associated with sediment toxicity. The three sites with TEC exceedences for PAHs are from the confluence of Crabtree Creek with the Neuse River and downstream; Crabtree Creek runs through the several very developed portions of Cary, Morrisville and Raleigh where water quality impacts of urban run-off would be anticipated.

For the pollutants measured in this assessment, the whole-sediments from the impounded reach of Milburnie Dam are not of toxicological concern. It is noted that the upstream Falls Lake dam has impounded the Neuse River since 1983; the size of that structure makes it an efficient sediment trap for inputs to the Neuse River system upstream of the impounded reach of Milburnie Dam. Also, the Neuse River experienced flows of record over the last 15 years with hurricanes in 1996 and 1999, particularly Floyd and Fran, which were probably significant sediment-moving events in the watershed in the area of Milburnie Dam. These factors may explain the relatively low concentrations of pollutants in the impoundment sediments.

Elutriate toxicity tests

Control survival of cladocerans in the elutriate test was 100% and met the test acceptability requirements in USEPA (1993). In 2-d sediment elutriate (water-extractable fraction) tests with *C. dubia*, survival ranged from 80 to 100% in elutriates from the upstream sites and 70 to 100% in the downstream sites (Table 4). While there were no replicates or dilutions of elutriate samples tested, a 20 to 30% incidence in toxicity was likely only a marginal response of the test organisms in a 100% elutriate sample. If sediments were re-suspended during dam removal, it is likely that there would be substantial dilution of the re-suspended sediments with site water (beyond the 1 part sediment to 4 parts water used to prepare the 100% elutriate samples).

Pore-water and elutriate chemistry

Tables 4 though 7 summarize the chemistry of elutriates and pore-water. Although the elutriates and pore-water samples are not surface waters, we compared elemental contaminant concentrations in these media to State water quality standards and action levels (NCDENR 2007)

(Table 8). This is not a regulatory application of the standards; it is rather a comparison of test results to the standards as relevant benchmarks, or estimates of safe water column concentrations. No elemental contaminants in pore-water exceeded these benchmarks (Tables 7 and 8) and the pore-water data is consistent with the low concentrations of elemental contaminants observed in the whole-sediment.

Total copper concentrations from less than the 7 µg/L action level to 17.5 µg/L were measured in the elutriate samples. The highest concentration was from an elutriate prepared from a downstream sediment sample (D1), and total copper concentrations in elutriates from the six upstream samples were not statistically-different than those from the four downstream sites. Importantly, the two filtered samples (D3filtered and D5filtered) contained less than 1 µg/L dissolved copper. Total lead concentrations from 326 to 12,200 µg/L were measured in the elutriate samples, well in excess of the 25 µg/L State standard. The highest concentration was also from an elutriate prepared from a downstream sediment sample (D1), and total lead concentrations in elutriates from the six upstream samples were not statistically-different than those from the four downstream sites. The two filtered samples (D3filtered and D5filtered) contained 4.9 to 5.5 µg/L dissolved lead, well below the State standard.

The elevated total lead and copper is likely associated with suspended particles in the elutriate samples. Elutriate tests aid in the evaluation of the potential short-term effects associated with suspended sediments within the water column. While the elutriate results for total copper and lead are an indication that aggressive re-suspension of sediments like those tested could temporarily impair surface water quality, the State, mirroring USEPA, is moving from regulating metals on a total recoverable basis to a dissolved basis to better reflect the bioavailable fraction. Mobilization of sediments we tested may be a short-term water column concern for total copper and lead concentrations based on the elutriate chemistry results but they are unlikely to be of toxicological concern based on the filtered sample results and elutriate toxicity testing (especially considering the lack of dilution of the 100% elutriate samples). Sediment re-suspension and contaminant release in the elutriate tests may be near or beyond a worst-case simulation of actual conditions following sediment disturbing activities like a dam removal. Dilution of re-suspended sediments during dam removal may be far in excess of the 1:4 ratio of sediments to dilution water used to create the 100% elutriate samples we tested. Additional synthesis may help characterize the expected low importance of this issue. If necessary, qualitative or quantitative estimates of sediment re-suspension caused by specific sediment disturbing activities (like dam deconstruction, impoundment dewatering, and dam removal) will help put the elutriate test results in context (USEPA/USACE 1998). Existing physical data on the sediments (ENTRIX 2010) and chemical and toxicological data (this report) should be sufficient for dam removal planning.

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Table 1. Total organic carbon, grain size, and moisture measured in whole-sediment samples collected from the Neuse River in August 2011.

	Sample ID	Total Organic Carbon (%)	Sand (%)	Clay (%)	Silt (%)	Moisture (%)
		ENCO ¹	CERC ²	CERC	CERC	ENCO
Upstream of Milburnie Dam	S22	1.1	69	17	14	34.0
	S18A	2.7	60	17	24	50.5
	S13	3.3	30	23	48	64.4
	S6	2.3	44	21	36	52.6
	S6A	2.7	44	19	38	54.4
	S2	4.3	27	26	47	71.7
Downstream	D1	1.6	65	17	18	42.7
	D3	1.3	65	17	18	40.4
	D4	0.85	61	17	22	37.2
	D5	2.3	53	21	26	49.2

¹ENCO = Environmental Conservation Laboratories, Inc., Cary, NC

²CERC = USGS Columbia Environmental Research Center, Columbia, MO

Table 2. Elemental contaminants (mg/kg dry weight, or parts per million) in whole-sediment samples collected from the Neuse River, August 2011. For each element, results are compared to threshold-effects concentration (TEC) guidelines of MacDonald et al. (2000) – values below which adverse effects to sensitive aquatic organisms are not expected to occur, and probable effects concentrations (PECs) – values above which adverse effects to sediment dwelling organisms may be expected. No samples exceeded the PECs. Only zinc at site S13 (**in bold**) exceeded TECs; the measured concentration (151 mg/kg) is well below the geometric mean of the TEC and PEC for zinc (236 mg/kg).

	Sample ID	Al	As	Cd	Cr	Cu	Fe	Pb	Mn	Hg	Ni	Zn
Upstream of Milburnie Dam	S22	6720 B	1.51	<0.03	13.9	8.34	10600 B	8.19	489	0.02	5.57	33.3
	S18A	11200 B	2.53	<0.03	19.4	14.8	17900 B	13.4	681	0.03	8.96	52.8
	S13	18800 B	5.00	<0.03	28.9	25.4	27300 B	22.9	995	0.06	12.0	151
	S6	13200 B	3.34	<0.03	21.1	16.9	19500 B	15.2	635	0.04	9.30	59.1
	S6A	14100 B	2.75	<0.03	22.6	17.9	20300 B	16.1	603	0.05	9.94	64.2
	S2	20900 B	3.76	<0.03	29.3	26.0	28000 B	23.3	1030	0.06	13.1	93.9
Downstream	D1	9260 B	1.67	<0.03	16.5	10.8	14500 B	10.9	707	0.02	7.02	42.2
	D3	8260 B	1.88	<0.03	13.8	14.3	12600 B	12.9	492	0.03	6.44	50.8
	D4	7810 B	1.76	<0.03	11.3	11.9	12200 B	14.8	401	0.02	5.45	57.7
	D5	10900 B	2.88	<0.03	15.6	19.5	16800 B	22.9	777	0.04	7.05	88.2
TEC Guideline Value			9.79	0.99	43.4	31.6		35.8		0.18	22.7	121
PEC Guideline Value			33	4.98	111	149		128		1.06	48.6	459

B = aluminum and iron were detected in the lab blank at 3.75 mg/kg (Al) and 2.28 mg/kg (Fe). Because sample results were three to four orders of magnitude higher than those concentrations, the presence of these metals in the blank does not affect interpretation of results.

Figure 10. Zinc concentrations of sediments collected within the Milburnie Dam impounded reach and downstream of the dam in the Neuse River. Results are compared to threshold-effects concentration (TEC) guidelines of MacDonald et al. (2000) -- values below which adverse effects to sensitive aquatic organisms should not occur, and probable effects concentrations (PECs) -- values above which adverse effects to sediment dwelling organisms may be expected (MacDonald et al. 2000). Also included is the geometric mean of the TEC and PEC, for reference. No samples exceeded the PECs. Only zinc at site S13 marginally exceeded TECs; the measured concentration (151 mg/kg) is well below the geometric mean of the TEC and PEC for zinc (236 mg/kg).

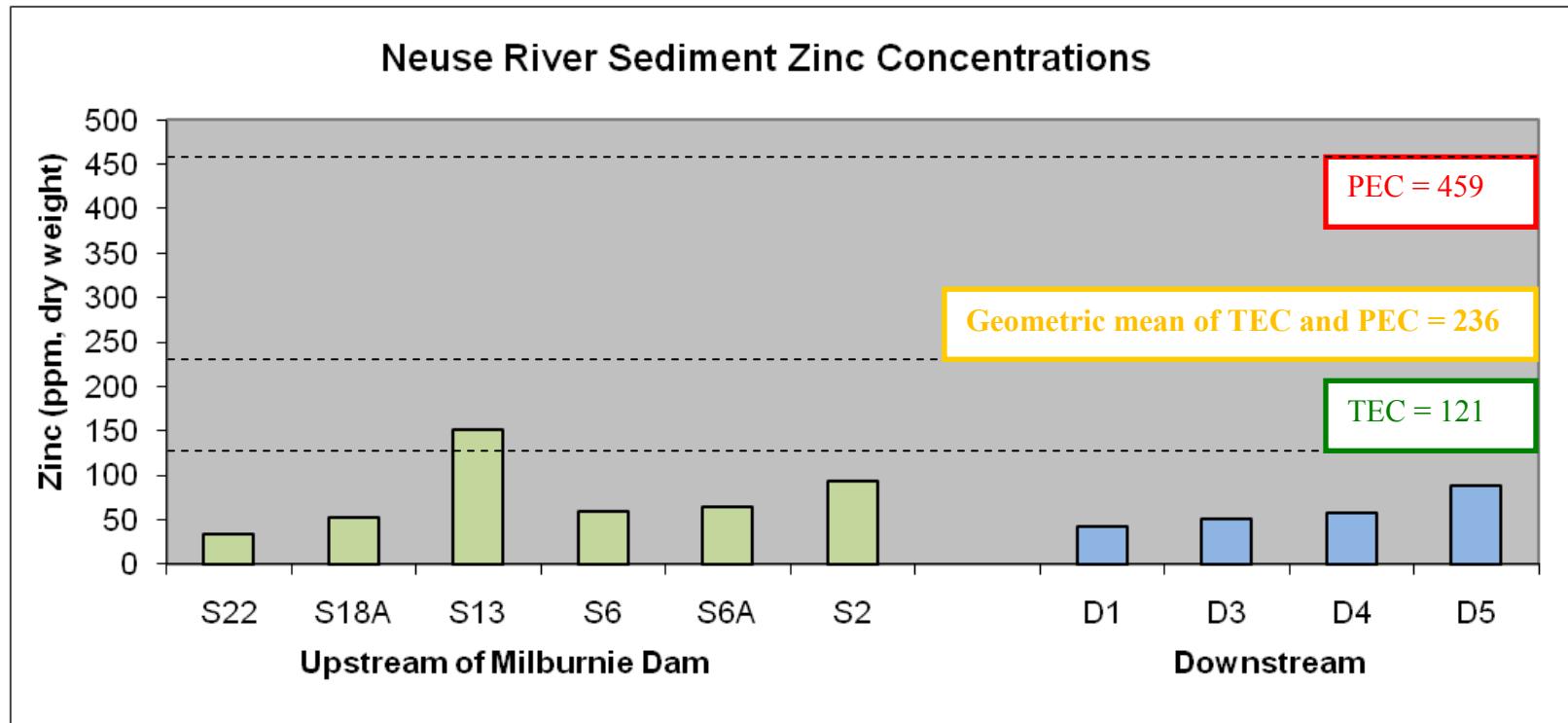


Table 3. Polycyclic aromatic hydrocarbons measured in whole-sediment samples collected from the Neuse River in August 2011. All data are µg/kg dry weight (parts per billion). For each element, results are compared to threshold-effects concentration (TEC) guidelines of MacDonald et al. (2000) – values below which adverse effects to sensitive aquatic organisms are not expected to occur, and probable effects concentrations (PECs) – values above which adverse effects to sediment dwelling organisms may be expected. No samples exceeded the PECs. Only the downstream samples exceeded the TECs (**exceedences of TECs highlighted in bold**). 1-Methylnaphthalene, 2-Methylnaphthalene, Acenaphthene, Acenaphthylene, Anthracene, Fluorene, and Naphthalene were included in analyses but were not detected in any samples. U = not detected.

	Sample ID	Benz(a)anthracene	Benz(a)pyrene	Benz(b)fluoranthene	Benz(g,h,i)perylene	Benz(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Indeno(1,2,3-cd)pyrene	Phenanthrene	Pyrene
Upstream of Milburne Dam	S22	12 U	11 U	56	24 U	11 U	13 U	21 U	86	21 U	13 U	66
	S18A	16 U	14 U	74	32 U	14 U	18 U	28 U	87	28 U	17 U	22 U
	S13	22 U	94	150	45 U	20 U	25 U	39 U	170	39 U	24 U	130
	S6	17 U	15 U	84	34 U	15 U	19 U	30 U	98	30 U	18 U	77
	S6A	18 U	15 U	100	35 U	15 U	20 U	31 U	100	31 U	19 U	80
	S2	28 U	25 U	28 U	56 U	25 U	31 U	49 U	39 U	49 U	30 U	39 U
Downstream	D1	14 U	64	87	28 U	12 U	16 U	24 U	93	24 U	15 U	76
	D3	200	320	530	290	210	340	23 U	610	250	170	480
	D4	330	550	830	430	360	550	90	1000	390	290	800
	D5	510	880	1500	810	500	1000	160	1700	720	490	1300
TEC Screening Value		108	150				166	33	423		204	195
PEC Screening Value		1050	1450				1290		2230		1170	1520

Table 4. Water quality characteristics of, and 2-day *Ceriodaphnia dubia* survival in, elutriates prepared from sediments collected upstream and downstream of Milburnie Dam on the Neuse River, North Carolina.

	Sample ID	<i>Ceriodaphnia</i> Survival (%)	Dissolved oxygen (mg/L)	Conductivity (umho@25°C)	pH	Alkalinity (mg/L as CaCO ₃)	Ammonia (mg/L)	Un-ionized ammonia (mg/L)	Hardness (mg/L as CaCO ₃)	Total filterable sulfide (mg/L)	Dissolved organic carbon (mg/L)
Upstream of Milburnie Dam	S22	100	3.5	190	7.5	54	1.70	0.027	52	< 0.001	2.46
	S18A	100	4.4	204	6.9	62	3.39	0.015	54	< 0.001	2.12
	S13	90	3.1	261	7.1	82	6.98	0.044	68	< 0.001	2.47
	S6	100	3.4	267	6.9	100	26.5	0.097	64	< 0.001	2.16
	S6A	100	3.3	212	7.0	60	4.39	0.022	50	< 0.001	1.70
	S2	80	3.1	288	7.0	98	8.44	0.040	68	< 0.001	2.05
Downstream	D1	90	5.2	198	7.4	62	1.83	0.025	62	< 0.001	2.09
	D3	100	3.7	227	7.3	76	1.97	0.019	84	< 0.001	2.39
	D4	90	3.2	214	7.4	90	2.15	0.028	90	< 0.001	4.15
	D5	70	2.9	377	7.5	152	5.42	0.086	140	< 0.001	6.00

Table 5. Elemental contaminant concentrations ($\mu\text{g/L}$) of elutriates prepared from sediments collected upstream and downstream of Milburnie Dam on the Neuse River, North Carolina.

	Sample ID	As	Cd	Cr	Cu	Pb	Ni	Se	Zn	Hardness (mg/L as CaCO_3)
Upstream of Milburnie Dam	S22	<4.70	<1.00	6.33 JB	9.64 J	688	6.18 JB	<8.30	26.3 JB	54
	S18A	<4.70	<1.00	7.37 JB	12.9	4770	11.7 B	<8.30	29.9 JB	52
	S13	<4.70	<1.00	4.52 JB	6.18 J	591	4.39 JB	<8.30	26.8 JB	61
	S6	<4.70	<1.00	6.99 JB	13.8	5050	10.9 B	<8.30	46.2 JB	60
	S6A	0.729 J	0.163 J	5.33 JB	10.8	1860	4.63 B	<0.830	17.4 B	50
	S2	<4.70	<1.00	<4.50	7.35 J	2220	9.48 JB	<8.30	19.3 JB	68
Downstream	D1	<4.70	<1.00	11.6 B	17.5	12200	29.9 B	<8.30	41.6 JB	56
	D3	<4.70	<1.00	<4.50	6.20 J	660	7.33 JB	<8.30	25.1 JB	71
	D3filtered	<4.70	<1.00	<4.50	<1.00	4.91 J	3.06 JB	<8.30	11.7 JB	28
	D4	<4.70	<1.00	4.53 JB	6.60 J	326	4.80 JB	<8.30	40.3 JB	82
	D5	<4.70	<1.00	<4.50	8.34 J	2110	8.79 JB	<8.30	37.5 JB	130
	D5 filtered	<4.70	<1.00	<4.50	<1.00	5.50 J	30.8 B	<8.30	7.29 JB	38

B = Chrome, nickel and zinc were detected in the blanks, but at concentrations (Cr = 0.75 to 0.88 $\mu\text{g/L}$; Ni = 0.11 to 0.16 $\mu\text{g/L}$; and Zn = 0.47 to 0.51 $\mu\text{g/L}$) one to two orders of magnitude less than the actual samples; the presence of these metals in the blank should not affect interpretation of results.

J = less than reporting limit (estimated value)

Table 6. Water quality characteristics of pore-water extracted from sediments collected upstream and downstream of Milburnie Dam on the Neuse River, North Carolina.

	Sample ID	Dissolved oxygen (mg/L)	Conductivity (umho@25°C)	pH	Alkalinity (mg/L as CaCO ₃)	Ammonia (mg/L)	Un-ionized ammonia (mg/L)	Hardness (mg/L as CaCO ₃)	Total filterable sulfide (mg/L)	Dissolved organic carbon (mg/L)
Upstream of Milburnie Dam	S22	7.7	244	7.9	100	3.56	0.127	33	< 0.001	9.42
	S18A	3.7	354	7.0	164	9.71	0.053	124	0.002	6.80
	S13	1.9	599	6.9	272	20.7	0.076	190	0.002	10.71
	S6	1.7	638	7.0	288	19.5	0.088	206	0.001	9.82
	S6A	2.8	397	6.8	182	12.3	0.039	130	< 0.001	7.00
	S2	1.8	665	6.8	310	24.8	0.081	204	< 0.001	8.95
Downstream	D1	5.9	347	7.4	154	5.66	0.065	142	< 0.001	8.43
	D3	5.1	421	7.2	194	5.83	0.048	192	< 0.001	10.47
	D4	7.2	520	7.8	256	6.70	0.182	352	< 0.001	18.31
	D5	3.0	937	7.3	500	16.2	0.170	434	< 0.001	18.29

Table 7. Elemental contaminant concentrations ($\mu\text{g/L}$) of pore-water extracted from sediments collected upstream and downstream of Milburnie Dam on the Neuse River, North Carolina.

	Sample ID	As	Cd	Cr	Cu	Pb	Ni	Se	Zn	Hardness (mg/L as CaCO_3)
Upstream of Milburnie Dam	S22	<4.70	<1.00	<4.50	1.19 J	6.67 J	4.52 JB	<8.30	4.14 JB	12
	S18A	<4.70	<1.00	<4.50	1.10 J	7.00 J	<1.00	<8.30	20.8 JB	21
	S13	<4.70	<1.00	<4.50	1.07 J	6.01 J	2.36 JB	<8.30	9.76 JB	33
	S6	<4.70	<1.00	<4.50	2.27 J	7.13 J	1.91 JB	<8.30	4.09 JB	34
	S6A	<4.70	<1.00	<4.50	4.00 J	8.42 J	2.11 JB	<8.30	17.8 JB	23
	S2	<4.70	<1.00	<4.50	2.66 J	7.20 J	2.22 JB	<8.30	19.1 JB	38
Downstream	D1	<4.70	<1.00	<4.50	<1.00	5.73 J	3.20 JB	<8.30	<3.20	19
	D3	<4.70	<1.00	<4.50	4.29 J	6.63 J	3.68 JB	<8.30	25.6 JB	29
	D3filtered	0.931 J	0.106 J	1.26 JB	0.186 J	0.355 J	0.855 JB	<0.830	3.25 JB	56
	D4	1.40	<0.100	1.43 JB	0.557 J	0.638 J	0.923 JB	<0.830	2.59 JB	40
	D5	2.41	0.123 J	1.46 JB	0.936 J	1.12	1.07 JB	<0.830	2.08 JB	76
	D5 filtered	3.27	0.186 J	1.42 JB	0.160 J	0.153 J	1.70 JB	1.09	6.38 JB	150

B = Chrome, nickel and zinc were detected in the blanks, but at concentrations (Cr = 0.75 to 0.88 $\mu\text{g/L}$; Ni = 0.11 to 0.16 $\mu\text{g/L}$; and Zn = 0.47 to 0.51 $\mu\text{g/L}$) one to two orders of magnitude less than the actual samples; the presence of these metals in the blank should not affect interpretation of results.

J = less than reporting limit (estimated value)

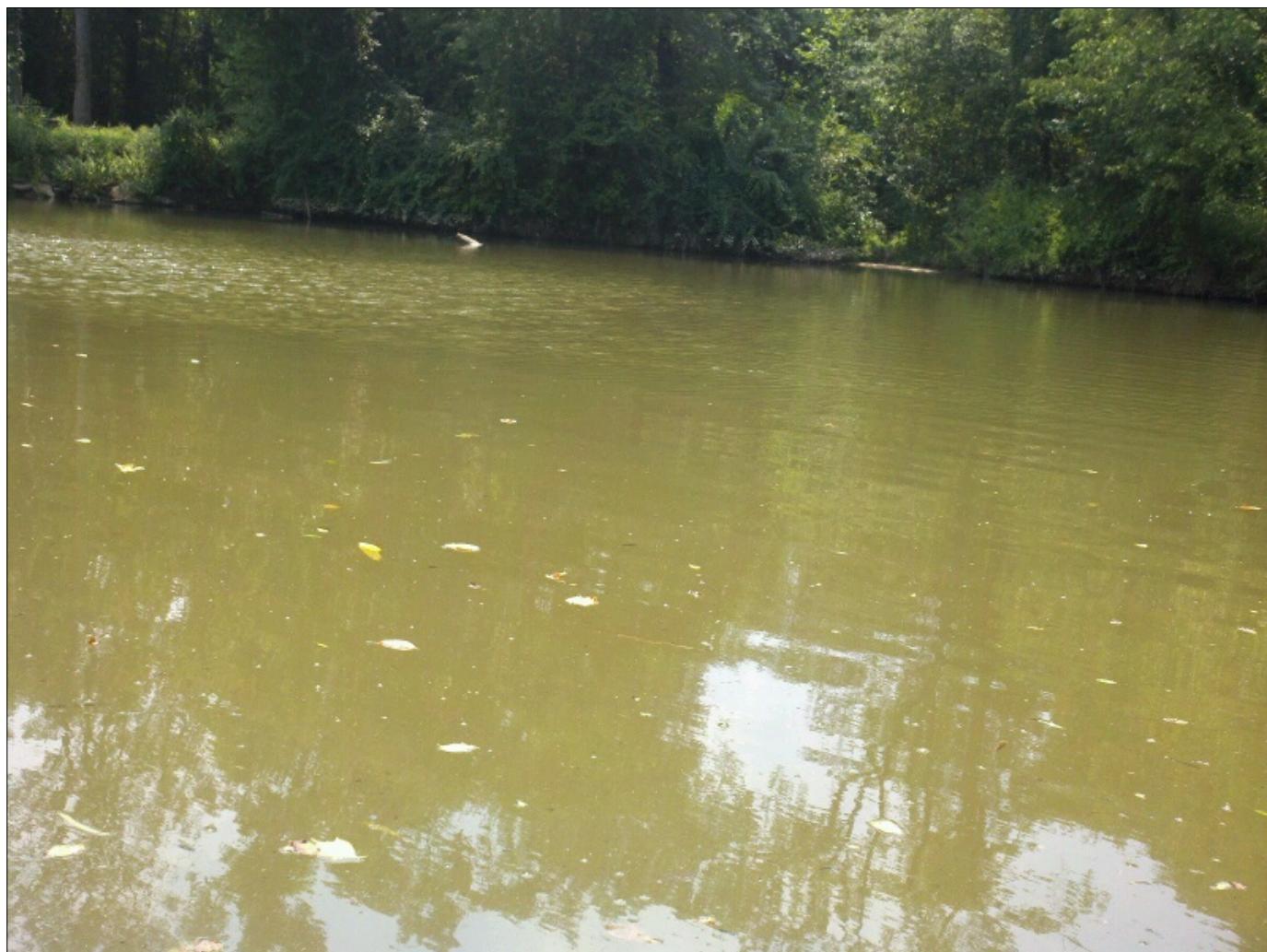
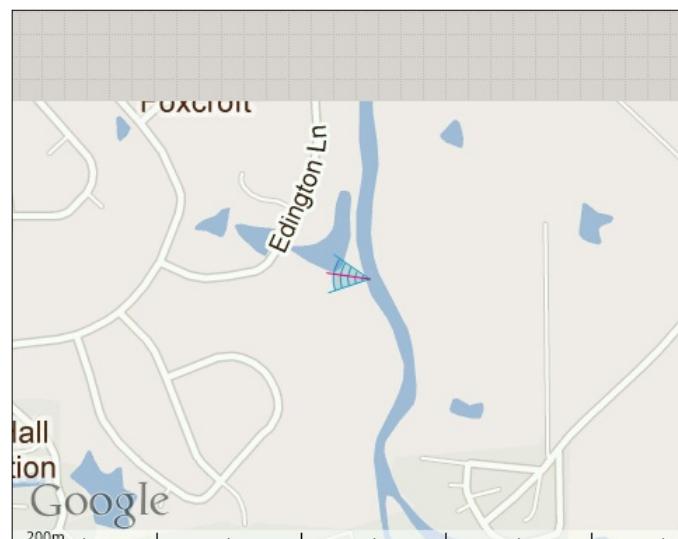
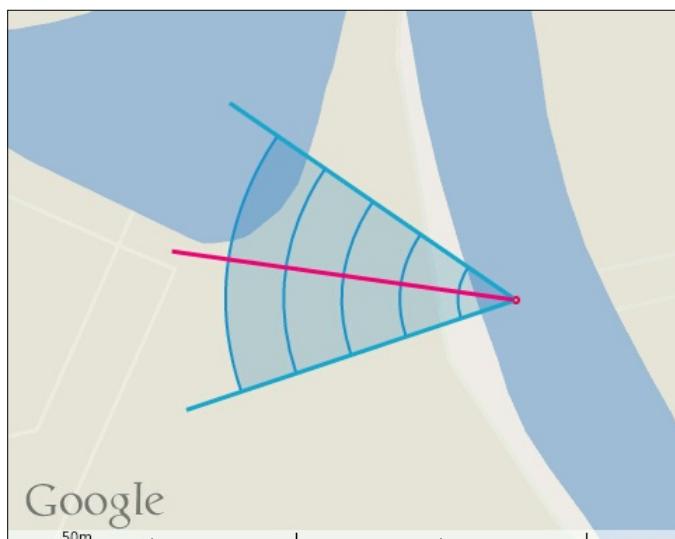
Table 8. Milburnie Dam impounded reach sediment elutriates and pore-water exceedences of North Carolina water quality standards or action levels for total recoverable elemental contaminants (NCDENR 2007). Analytical data for elutriates and pore-water are in Tables 5 and 7. Data in Table 5 for elutriates was used to compare total copper and lead in the upstream and downstream samples by the Wilcoxon rank sum test; the six upstream samples were not statistically-different than those from the four downstream sites.

Contaminant	Standard or Action Level	Elutriate samples in excess of benchmark (%)	Pore-water in excess of benchmark (%)
Arsenic	50 µg/L	0 (max <4.7 µg/L)	0 (max < 4.7 µg/L)
Cadmium	2 µg/L	0 (max <1.0 µg/L)	0 (max <1.0 µg/L)
Chromium	50 µg/L	0 (max = 7.37 µg/L)	0 (max <4.5 µg/L)
Copper	7 µg/L (AL)	83 (max = 13.8 µg/L)	0 (max = 4.00 µg/L)
Lead	25 µg/L	100 (max = 5050 µg/L)	0 (max = 8.42 µg/L)
Nickel	88 µg/L	0 (max = 11.7 µg/L)	0 (max = 4.52 µg/L)
Selenium	5 µg/L	0 (max <8.30 µg/L)	0 (max = <8.30 µg/L)
Zinc	50 µg/L (AL)	0 (max = 46.2 µg/L)	0 (max = 20.8 µg/L)

Appendix A – GPS records and photos of sample sites

3128 Tarheel Clubhouse Rd, Raleigh, NC 27604, USA

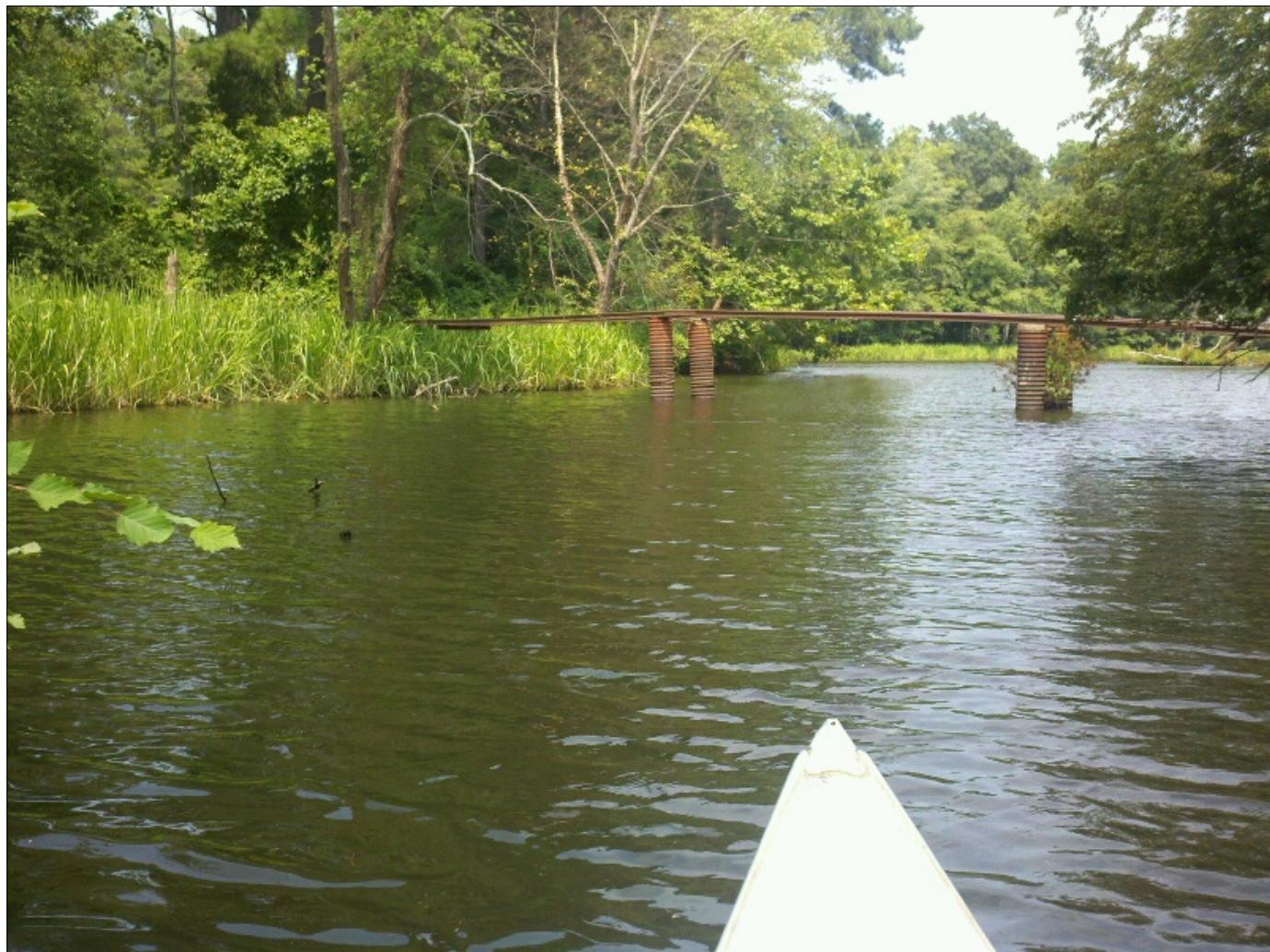
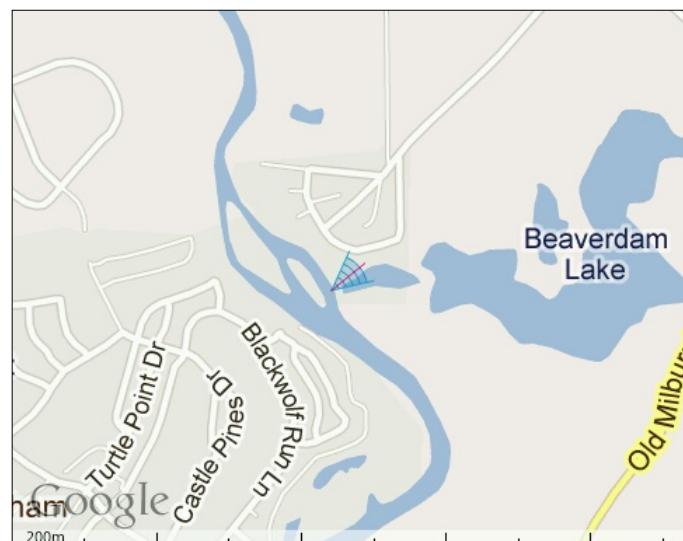
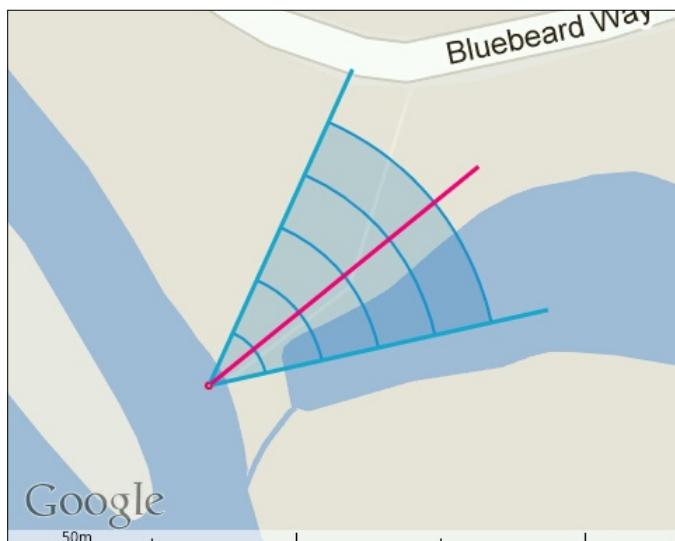
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S	N35.822295°±24.00m	W78.539432°±24.00m	89m±24.00	278°±5	6°±1	-4°±1



s22

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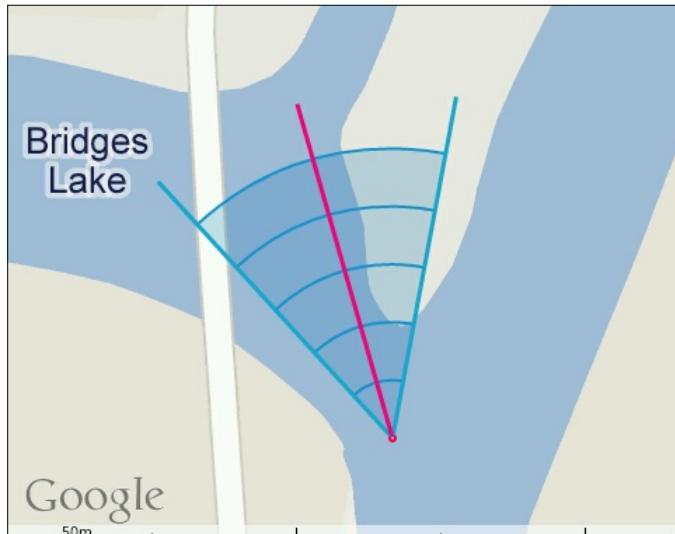
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S	N35.814712°±32.00m	W78.535696°±32.00m	79m±32.00	51°±6	2°±1	-1°±1



s18a

5605 Torness Ct, Raleigh, NC 27604, USA

	Latitude	Longitude	Altitude	Azimuth	Pitch	Roll
S	N35.804369°±12.00m	W78.538830°±12.00m	46m±12.00	344°±2	1°±2	0°±1



s13

GeoCam Report

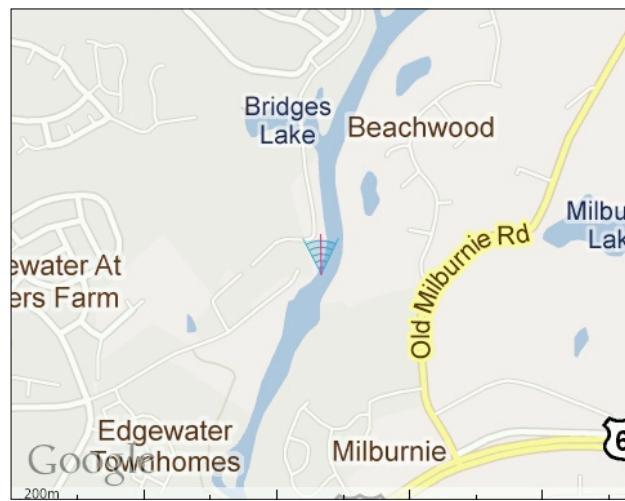
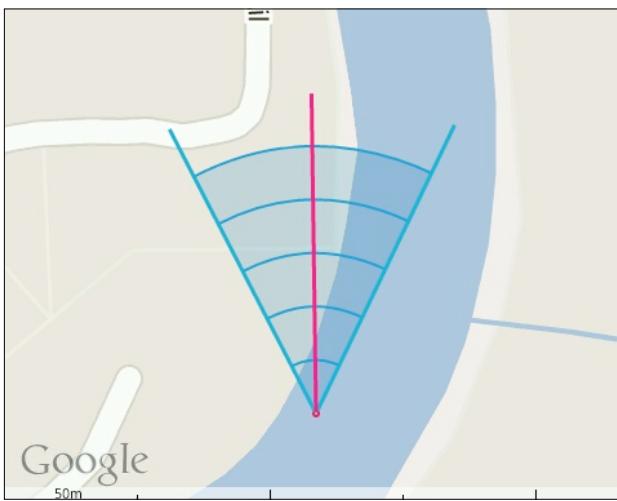
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2011:08:12 13:07 UTC

Raleigh Beach Rd, Raleigh, NC 27604, USA

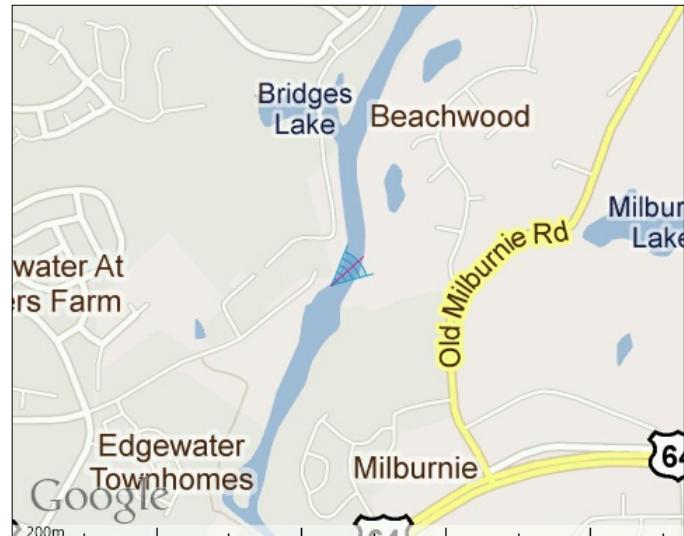
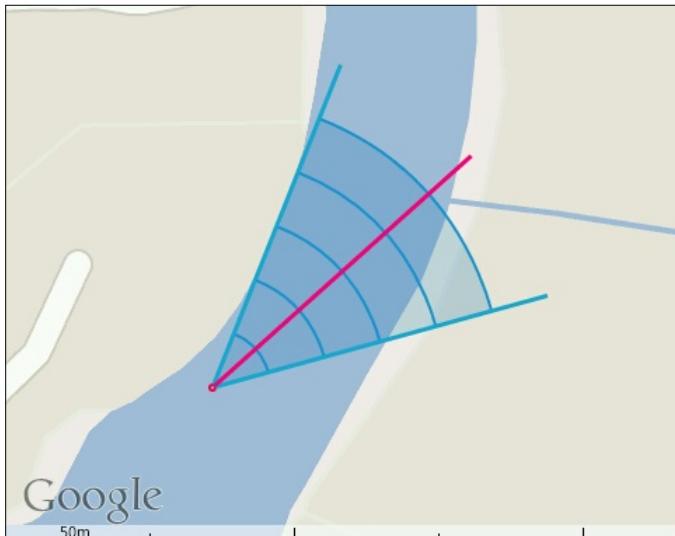
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S	N35.800994°±12.00m	W78.538858°±12.00m	98m±12.00	359°±1	5°±1	2°±1



S6

Raleigh Beach Rd, Raleigh, NC 27604, USA

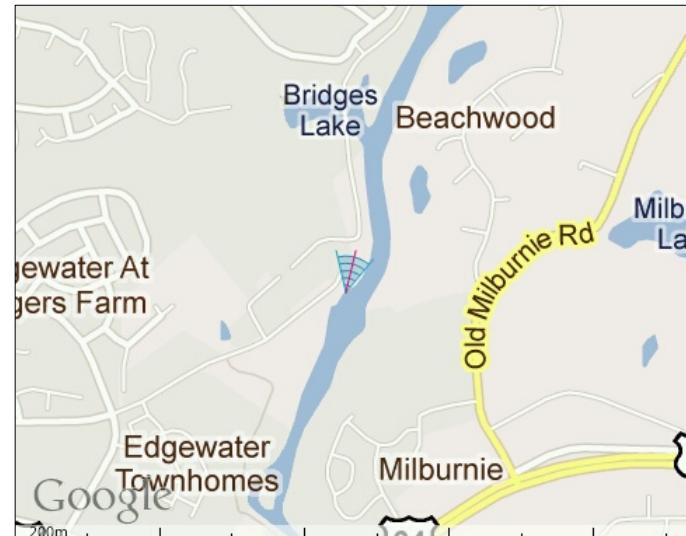
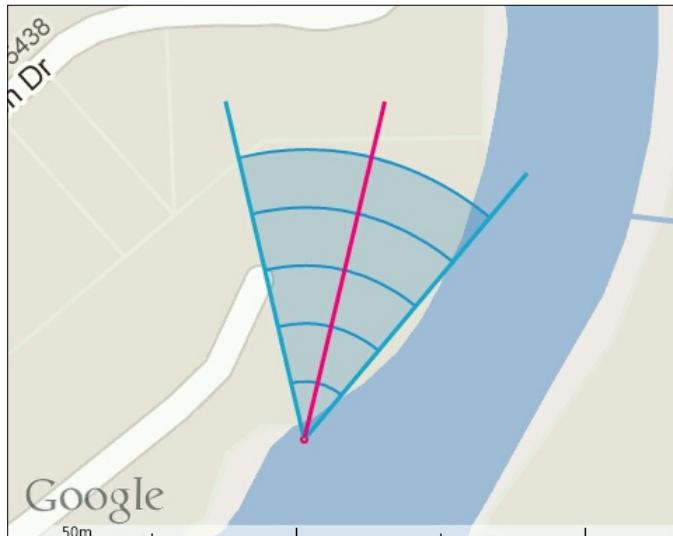
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S	N35.800731°±16.00m	W78.539120°±16.00m	64m±16.00	48°±2	9°±1	0°±1



6a

Raleigh Beach Rd, Raleigh, NC 27604, USA

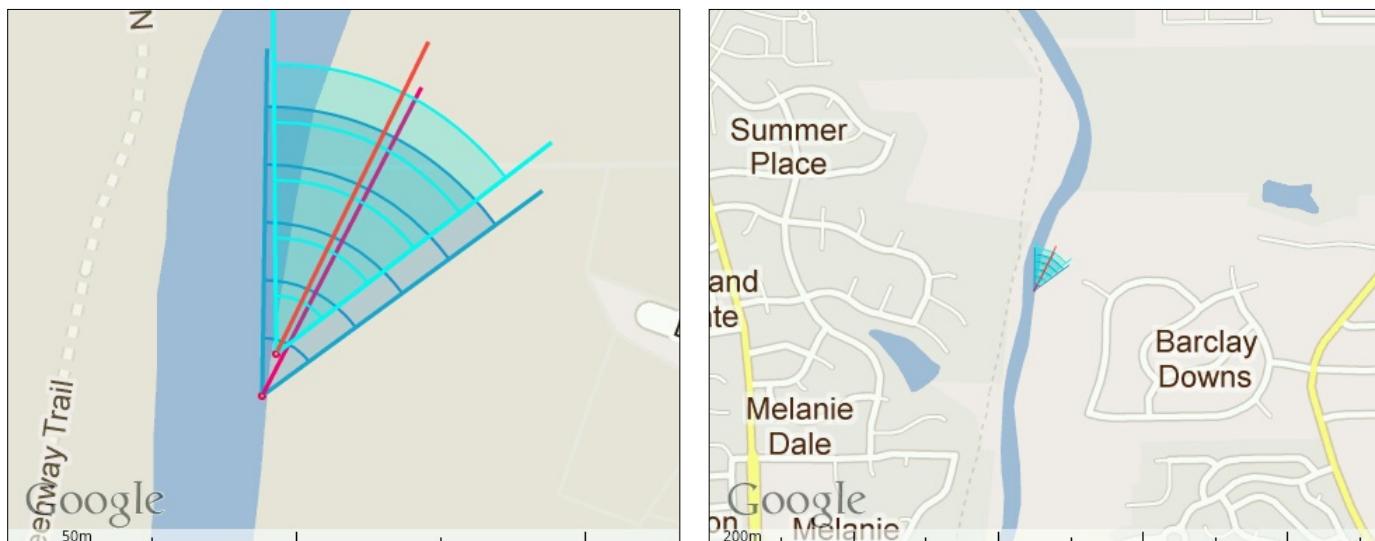
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S	N35.800620°±24.00m	W78.539461°±24.00m	83m±24.00	13°±4	11°±4	-3°±3



s2

103 Boland Way, Knightdale, NC 27545, USA

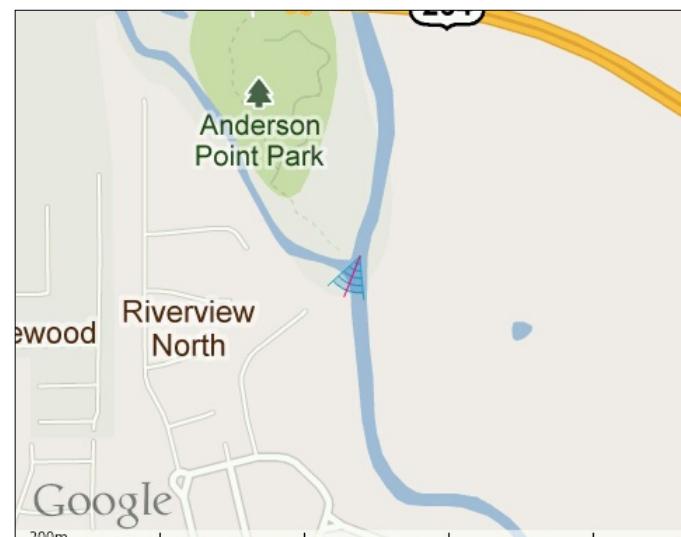
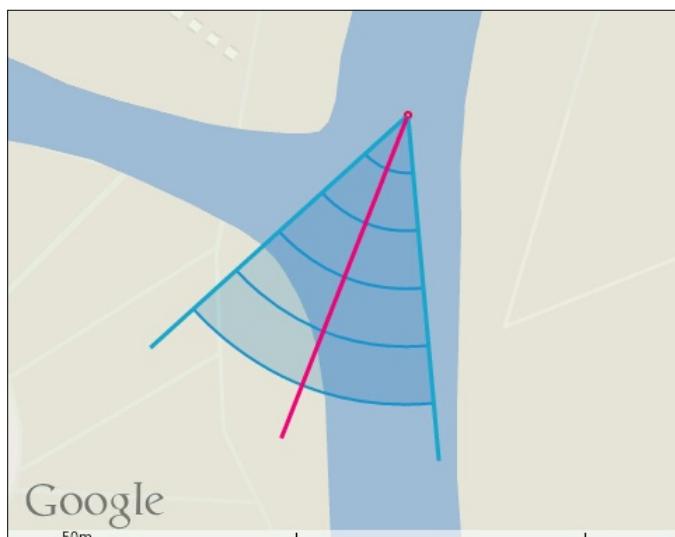
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S	N35.784691°±6.00m	W78.536504°±6.00m	47m±6.00	27°±3	-1°±1	1°±1
U	N35.784824° (Δ14m)	W78.536453° (Δ4m)		26° (Δ1°)		



d1

817 Riverview Rd, Raleigh, NC 27610, USA

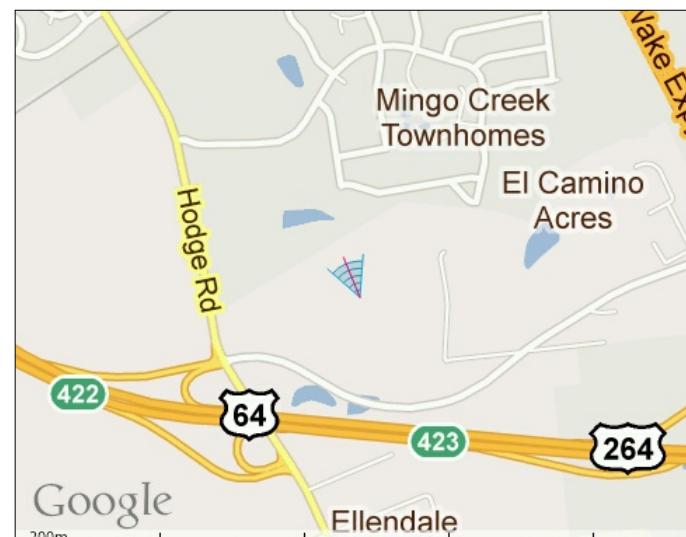
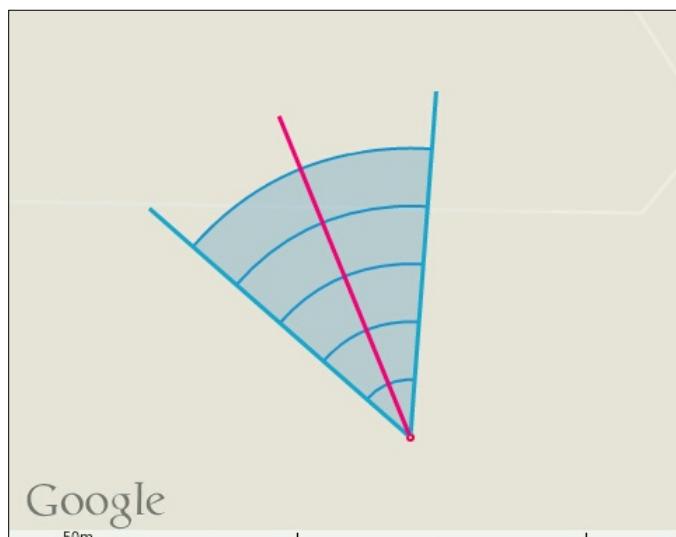
	Latitude	Longitude	Altitude	Azimuth	Pitch	Roll
S	N35.766557°±12.00m	W78.539517°±12.00m	69m±12.00	201°±6	-4°±5	-5°±4



d3

235 Money Tree Ln, Knightdale, NC 27545, USA

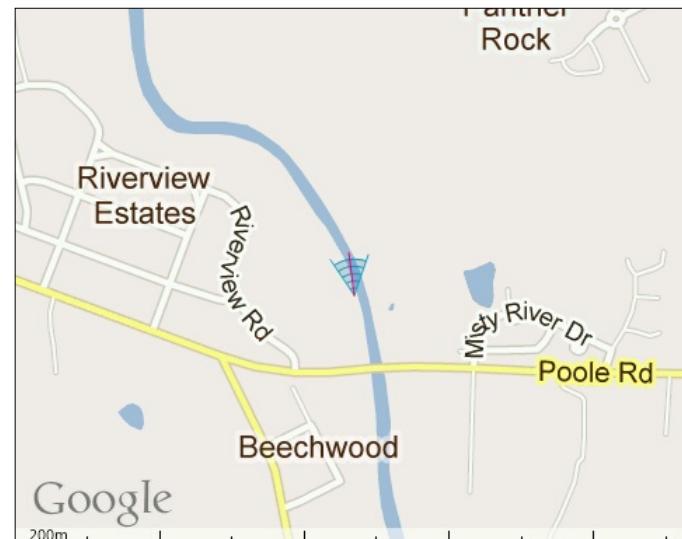
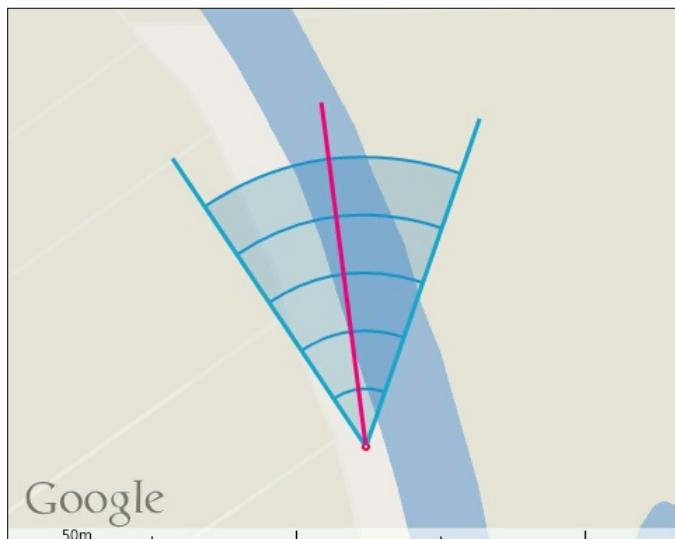
	Latitude	Longitude	Altitude	Azimuth	Pitch	Roll
S	N35.771445°±1655.00m	W78.518454°±1655.00m	0m±1655.00	338°±1	12°±1	0°±1



d4

1717 Riverview Rd, Raleigh, NC 27610, USA

	Latitude	Longitude	Altitude	Azimuth	Pitch	Roll
S	N35.756349°±12.00m	W78.532650°±12.00m	87m±12.00	353°±2	7°±1	-3°±1



d5

Appendix B – Analytical chemistry reports and chain of custody forms

Environmental Conservation Laboratories, Inc.

102-A Woodwinds Industrial Court

Cary NC, 27511

Phone: 919.467.3090 FAX: 919.467.3515



www.encolabs.com

Monday, August 29, 2011

RiverBank Ecosystems (RI010)

Attn: Adam Riggsbee

PO Box 29921

Austin, TX 78755

RE: Laboratory Results for

Project Number: Neuse River, Project Name/Desc: Neuse River

ENCO Workorder: C109800

Dear Adam Riggsbee,

Enclosed is a copy of your laboratory report for test samples received by our laboratory on Monday, August 15, 2011.

Unless otherwise noted in an attached project narrative, all samples were received in acceptable condition and processed in accordance with the referenced methods/procedures. Results for these procedures apply only to the samples as submitted.

The analytical results contained in this report are in compliance with NELAC standards, except as noted in the project narrative. This report shall not be reproduced except in full, without the written approval of the Laboratory.

This report contains only those analyses performed by Environmental Conservation Laboratories. Unless otherwise noted, all analyses were performed at ENCO Cary. Data from outside organizations will be reported under separate cover.

If you have any questions or require further information, please do not hesitate to contact me.

Sincerely,

A handwritten signature in black ink that reads "Chuck Smith".

Chuck Smith

Project Manager

Enclosure(s)



www.encolabs.com

SAMPLE SUMMARY/LABORATORY CHRONICLE

Client ID:	S22	Lab ID:	C109800-01	Sampled:	08/12/11 14:20	Received:	08/15/11 09:44
Parameter	Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)		
EPA 6010C	02/08/12		08/16/11	13:00	8/17/2011	11:00	
EPA 7471B	09/09/11		08/16/11	10:07	8/16/2011	14:58	
EPA 8270D	08/26/11	09/25/11	08/16/11	05:17	8/19/2011	06:18	
Walkley Black Method	09/11/11		08/17/11	10:07	8/17/2011	12:23	

Client ID:	S18A	Lab ID:	C109800-02	Sampled:	08/12/11 14:45	Received:	08/15/11 09:44
Parameter	Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)		
EPA 6010C	02/08/12		08/16/11	13:00	8/17/2011	11:15	
EPA 7471B	09/09/11		08/16/11	10:07	8/16/2011	15:10	
EPA 8270D	08/26/11	09/25/11	08/16/11	05:17	8/19/2011	02:05	
Walkley Black Method	09/11/11		08/17/11	10:07	8/17/2011	12:23	

Client ID:	S13	Lab ID:	C109800-03	Sampled:	08/12/11 11:50	Received:	08/15/11 09:44
Parameter	Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)		
EPA 6010C	02/08/12		08/16/11	13:00	8/17/2011	11:17	
EPA 7471B	09/09/11		08/16/11	10:07	8/16/2011	15:13	
EPA 8270D	08/26/11	09/25/11	08/16/11	05:17	8/19/2011	02:33	
Walkley Black Method	09/11/11		08/17/11	10:07	8/17/2011	12:23	

Client ID:	S6	Lab ID:	C109800-04	Sampled:	08/12/11 08:55	Received:	08/15/11 09:44
Parameter	Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)		
EPA 6010C	02/08/12		08/16/11	13:00	8/17/2011	11:19	
EPA 7471B	09/09/11		08/16/11	10:07	8/16/2011	15:16	
EPA 8270D	08/26/11	09/25/11	08/16/11	05:17	8/19/2011	03:01	
Walkley Black Method	09/11/11		08/17/11	10:07	8/17/2011	12:23	

Client ID:	S6A	Lab ID:	C109800-05	Sampled:	08/12/11 08:45	Received:	08/15/11 09:44
Parameter	Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)		
EPA 6010C	02/08/12		08/16/11	13:00	8/17/2011	11:20	
EPA 7471B	09/09/11		08/16/11	10:07	8/16/2011	15:19	
EPA 8270D	08/26/11	09/25/11	08/16/11	05:17	8/19/2011	03:29	
Walkley Black Method	09/11/11		08/17/11	10:07	8/17/2011	12:23	

Client ID:	S2	Lab ID:	C109800-06	Sampled:	08/12/11 09:40	Received:	08/15/11 09:44
Parameter	Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)		
EPA 6010C	02/08/12		08/16/11	13:00	8/17/2011	11:22	
EPA 7471B	09/09/11		08/16/11	10:07	8/16/2011	15:27	
EPA 8270D	08/26/11	09/25/11	08/16/11	05:17	8/19/2011	03:57	
Walkley Black Method	09/11/11		08/17/11	10:07	8/17/2011	12:23	

Client ID:	D1	Lab ID:	C109800-07	Sampled:	08/11/11 14:55	Received:	08/15/11 09:44
Parameter		Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)	
EPA 6010C		02/07/12		08/16/11	13:00	8/17/2011	11:24
EPA 7471B		09/08/11		08/16/11	10:07	8/16/2011	15:30
EPA 8270D		08/25/11	09/25/11	08/16/11	05:17	8/19/2011	04:26
Walkley Black Method		09/10/11		08/17/11	10:07	8/17/2011	12:23

Client ID:	D3	Lab ID:	C109800-08	Sampled:	08/11/11 13:18	Received:	08/15/11 09:44
Parameter		Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)	
EPA 6010C		02/07/12		08/16/11	13:00	8/17/2011	11:26
EPA 7471B		09/08/11		08/16/11	10:07	8/16/2011	15:33
EPA 8270D		08/25/11	09/25/11	08/16/11	05:17	8/19/2011	04:54
Walkley Black Method		09/10/11		08/17/11	10:07	8/17/2011	12:23

Client ID:	D4	Lab ID:	C109800-09	Sampled:	08/11/11 11:21	Received:	08/15/11 09:44
Parameter		Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)	
EPA 6010C		02/07/12		08/16/11	13:00	8/17/2011	11:28
EPA 7471B		09/08/11		08/16/11	10:07	8/16/2011	15:36
EPA 8270D		08/25/11	09/25/11	08/16/11	05:17	8/19/2011	05:22
Walkley Black Method		09/10/11		08/17/11	10:07	8/17/2011	12:23

Client ID:	D5	Lab ID:	C109800-10	Sampled:	08/11/11 09:45	Received:	08/15/11 09:44
Parameter		Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)	
EPA 6010C		02/07/12		08/16/11	13:00	8/17/2011	11:30
EPA 7471B		09/08/11		08/16/11	10:07	8/16/2011	15:39
EPA 8270D		08/25/11	09/25/11	08/16/11	05:17	8/19/2011	05:50
Walkley Black Method		09/10/11		08/17/11	10:07	8/17/2011	12:23

SAMPLE DETECTION SUMMARY

Client ID: S22	Lab ID: C109800-01						
Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Aluminum - Total	6720	B	3.18	15.2	mg/kg dry	EPA 6010C	QB-01
Arsenic - Total	1.51		0.152	0.758	mg/kg dry	EPA 6010C	
Benzo(b)fluoranthene	0.056		0.012	0.050	mg/kg dry	EPA 8270D	
Chromium - Total	13.9		0.152	0.758	mg/kg dry	EPA 6010C	
Copper - Total	8.34		0.288	0.758	mg/kg dry	EPA 6010C	
Fluoranthene	0.086		0.017	0.050	mg/kg dry	EPA 8270D	
Iron - Total	10600	B	0.727	3.79	mg/kg dry	EPA 6010C	QB-01
Lead - Total	8.19		0.182	0.758	mg/kg dry	EPA 6010C	
Manganese - Total	489		0.152	0.758	mg/kg dry	EPA 6010C	
Mercury - Total	0.0188		0.00924	0.0152	mg/kg dry	EPA 7471B	
Nickel - Total	5.57		0.546	3.79	mg/kg dry	EPA 6010C	
Pyrene	0.066		0.017	0.050	mg/kg dry	EPA 8270D	
Total Organic Carbon	11000		760	760	mg/kg dry	Walkley Black Method	
Zinc - Total	33.3		1.67	3.79	mg/kg dry	EPA 6010C	

Client ID: S18A	Lab ID: C109800-02						
Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Aluminum - Total	11200	B	4.24	20.2	mg/kg dry	EPA 6010C	QB-01
Arsenic - Total	2.53		0.202	1.01	mg/kg dry	EPA 6010C	
Benzo(b)fluoranthene	0.074		0.016	0.067	mg/kg dry	EPA 8270D	
Chromium - Total	19.4		0.202	1.01	mg/kg dry	EPA 6010C	
Copper - Total	14.8		0.384	1.01	mg/kg dry	EPA 6010C	
Fluoranthene	0.087		0.022	0.067	mg/kg dry	EPA 8270D	
Iron - Total	17900	B	0.969	5.05	mg/kg dry	EPA 6010C	QB-01
Lead - Total	13.4		0.242	1.01	mg/kg dry	EPA 6010C	
Manganese - Total	681		0.202	1.01	mg/kg dry	EPA 6010C	
Mercury - Total	0.0344		0.0123	0.0202	mg/kg dry	EPA 7471B	
Nickel - Total	8.96		0.727	5.05	mg/kg dry	EPA 6010C	
Total Organic Carbon	27000		1000	1000	mg/kg dry	Walkley Black Method	
Zinc - Total	52.8		2.22	5.05	mg/kg dry	EPA 6010C	

Client ID: S13	Lab ID: C109800-03						
Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Aluminum - Total	18800	B	5.90	28.1	mg/kg dry	EPA 6010C	QB-01
Arsenic - Total	5.00		0.281	1.41	mg/kg dry	EPA 6010C	
Benzo(a)pyrene	0.094		0.020	0.093	mg/kg dry	EPA 8270D	
Benzo(b)fluoranthene	0.15		0.022	0.093	mg/kg dry	EPA 8270D	
Chromium - Total	28.9		0.281	1.41	mg/kg dry	EPA 6010C	
Copper - Total	25.4		0.534	1.41	mg/kg dry	EPA 6010C	
Fluoranthene	0.17		0.031	0.093	mg/kg dry	EPA 8270D	
Iron - Total	27300	B	1.35	7.03	mg/kg dry	EPA 6010C	QB-01
Lead - Total	22.9		0.337	1.41	mg/kg dry	EPA 6010C	
Manganese - Total	995		0.281	1.41	mg/kg dry	EPA 6010C	
Mercury - Total	0.0647		0.0171	0.0281	mg/kg dry	EPA 7471B	
Nickel - Total	12.0		1.01	7.03	mg/kg dry	EPA 6010C	
Pyrene	0.13		0.031	0.093	mg/kg dry	EPA 8270D	
Total Organic Carbon	33000		1400	1400	mg/kg dry	Walkley Black Method	
Zinc - Total	151		3.09	7.03	mg/kg dry	EPA 6010C	

Client ID:	S6	Lab ID:	C109800-04				
Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Aluminum - Total	13200	B	4.43	21.1	mg/kg dry	EPA 6010C	QB-01
Arsenic - Total	3.34		0.211	1.06	mg/kg dry	EPA 6010C	
Benzo(b)fluoranthene	0.084		0.016	0.070	mg/kg dry	EPA 8270D	
Chromium - Total	21.1		0.211	1.06	mg/kg dry	EPA 6010C	
Copper - Total	16.9		0.401	1.06	mg/kg dry	EPA 6010C	
Fluoranthene	0.098		0.023	0.070	mg/kg dry	EPA 8270D	
Iron - Total	19500	B	1.01	5.28	mg/kg dry	EPA 6010C	QB-01
Lead - Total	15.2		0.253	1.06	mg/kg dry	EPA 6010C	
Manganese - Total	635		0.211	1.06	mg/kg dry	EPA 6010C	
Mercury - Total	0.0364		0.0129	0.0211	mg/kg dry	EPA 7471B	
Nickel - Total	9.30		0.760	5.28	mg/kg dry	EPA 6010C	
Pyrene	0.077		0.023	0.070	mg/kg dry	EPA 8270D	
Total Organic Carbon	23000		1100	1100	mg/kg dry	Walkley Black Method	
Zinc - Total	59.1		2.32	5.28	mg/kg dry	EPA 6010C	

Client ID:	S6A	Lab ID:	C109800-05				
Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Aluminum - Total	14100	B	4.61	21.9	mg/kg dry	EPA 6010C	QB-01
Arsenic - Total	2.75		0.219	1.10	mg/kg dry	EPA 6010C	
Benzo(b)fluoranthene	0.10		0.017	0.072	mg/kg dry	EPA 8270D	
Chromium - Total	22.6		0.219	1.10	mg/kg dry	EPA 6010C	
Copper - Total	17.9		0.417	1.10	mg/kg dry	EPA 6010C	
Fluoranthene	0.10		0.024	0.072	mg/kg dry	EPA 8270D	
Iron - Total	20300	B	1.05	5.49	mg/kg dry	EPA 6010C	QB-01
Lead - Total	16.1		0.263	1.10	mg/kg dry	EPA 6010C	
Manganese - Total	603		0.219	1.10	mg/kg dry	EPA 6010C	
Mercury - Total	0.0464		0.0134	0.0219	mg/kg dry	EPA 7471B	
Nickel - Total	9.94		0.790	5.49	mg/kg dry	EPA 6010C	
Pyrene	0.080		0.024	0.072	mg/kg dry	EPA 8270D	
Total Organic Carbon	27000		1100	1100	mg/kg dry	Walkley Black Method	
Zinc - Total	64.2		2.41	5.49	mg/kg dry	EPA 6010C	

Client ID:	S2	Lab ID:	C109800-06				
Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Aluminum - Total	20900	B	7.42	35.3	mg/kg dry	EPA 6010C	QB-01
Arsenic - Total	3.76		0.353	1.77	mg/kg dry	EPA 6010C	
Chromium - Total	29.3		0.353	1.77	mg/kg dry	EPA 6010C	
Copper - Total	26.0		0.671	1.77	mg/kg dry	EPA 6010C	
Iron - Total	28000	B	1.69	8.83	mg/kg dry	EPA 6010C	QB-01
Lead - Total	23.3		0.424	1.77	mg/kg dry	EPA 6010C	
Manganese - Total	1030		0.353	1.77	mg/kg dry	EPA 6010C	
Mercury - Total	0.0573		0.0215	0.0353	mg/kg dry	EPA 7471B	
Nickel - Total	13.1		1.27	8.83	mg/kg dry	EPA 6010C	
Total Organic Carbon	43000		1800	1800	mg/kg dry	Walkley Black Method	
Zinc - Total	93.9		3.88	8.83	mg/kg dry	EPA 6010C	

Client ID:	D1	Lab ID:	C109800-07				
Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Aluminum - Total	9260	B	3.66	17.4	mg/kg dry	EPA 6010C	QB-01
Arsenic - Total	1.67		0.174	0.872	mg/kg dry	EPA 6010C	
Benzo(a)pyrene	0.064		0.012	0.058	mg/kg dry	EPA 8270D	

Client ID: D1		Lab ID: C109800-07					
Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Benzo(b)fluoranthene	0.087		0.014	0.058	mg/kg dry	EPA 8270D	
Chromium - Total	16.5		0.174	0.872	mg/kg dry	EPA 6010C	
Copper - Total	10.8		0.331	0.872	mg/kg dry	EPA 6010C	
Fluoranthene	0.093		0.019	0.058	mg/kg dry	EPA 8270D	
Iron - Total	14500	B	0.837	4.36	mg/kg dry	EPA 6010C	QB-01
Lead - Total	10.9		0.209	0.872	mg/kg dry	EPA 6010C	
Manganese - Total	707		0.174	0.872	mg/kg dry	EPA 6010C	
Mercury - Total	0.0224		0.0106	0.0174	mg/kg dry	EPA 7471B	
Nickel - Total	7.02		0.628	4.36	mg/kg dry	EPA 6010C	
Pyrene	0.076		0.019	0.058	mg/kg dry	EPA 8270D	
Total Organic Carbon	16000		870	870	mg/kg dry	Walkley Black Method	
Zinc - Total	42.2		1.92	4.36	mg/kg dry	EPA 6010C	

Client ID: D3		Lab ID: C109800-08					
Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Aluminum - Total	8260	B	3.52	16.8	mg/kg dry	EPA 6010C	QB-01
Arsenic - Total	1.88		0.168	0.838	mg/kg dry	EPA 6010C	
Benzo(a)anthracene	0.20		0.013	0.055	mg/kg dry	EPA 8270D	
Benzo(a)pyrene	0.32		0.012	0.055	mg/kg dry	EPA 8270D	
Benzo(b)fluoranthene	0.53		0.013	0.055	mg/kg dry	EPA 8270D	
Benzo(g,h,i)perylene	0.29		0.027	0.055	mg/kg dry	EPA 8270D	
Benzo(k)fluoranthene	0.21		0.012	0.055	mg/kg dry	EPA 8270D	
Chromium - Total	13.8		0.168	0.838	mg/kg dry	EPA 6010C	
Chrysene	0.34		0.015	0.055	mg/kg dry	EPA 8270D	
Copper - Total	14.3		0.319	0.838	mg/kg dry	EPA 6010C	
Fluoranthene	0.61		0.018	0.055	mg/kg dry	EPA 8270D	
Indeno(1,2,3-cd)pyrene	0.25		0.023	0.055	mg/kg dry	EPA 8270D	
Iron - Total	12600	B	0.805	4.19	mg/kg dry	EPA 6010C	QB-01
Lead - Total	12.9		0.201	0.838	mg/kg dry	EPA 6010C	
Manganese - Total	492		0.168	0.838	mg/kg dry	EPA 6010C	
Mercury - Total	0.0276		0.0102	0.0168	mg/kg dry	EPA 7471B	
Nickel - Total	6.44		0.604	4.19	mg/kg dry	EPA 6010C	
Phenanthrene	0.17		0.014	0.055	mg/kg dry	EPA 8270D	
Pyrene	0.48		0.018	0.055	mg/kg dry	EPA 8270D	
Total Organic Carbon	13000		840	840	mg/kg dry	Walkley Black Method	
Zinc - Total	50.8		1.84	4.19	mg/kg dry	EPA 6010C	

Client ID: D4		Lab ID: C109800-09					
Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Aluminum - Total	7810	B	3.34	15.9	mg/kg dry	EPA 6010C	QB-01
Arsenic - Total	1.76		0.159	0.796	mg/kg dry	EPA 6010C	
Benzo(a)anthracene	0.33		0.013	0.053	mg/kg dry	EPA 8270D	
Benzo(a)pyrene	0.55		0.011	0.053	mg/kg dry	EPA 8270D	
Benzo(b)fluoranthene	0.83		0.012	0.053	mg/kg dry	EPA 8270D	
Benzo(g,h,i)perylene	0.43		0.025	0.053	mg/kg dry	EPA 8270D	
Benzo(k)fluoranthene	0.36		0.011	0.053	mg/kg dry	EPA 8270D	
Chromium - Total	11.3		0.159	0.796	mg/kg dry	EPA 6010C	
Chrysene	0.55		0.014	0.053	mg/kg dry	EPA 8270D	
Copper - Total	11.9		0.302	0.796	mg/kg dry	EPA 6010C	
Dibenzo(a,h)anthracene	0.090		0.022	0.053	mg/kg dry	EPA 8270D	
Fluoranthene	1.0		0.018	0.053	mg/kg dry	EPA 8270D	

Client ID: D4		Lab ID: C109800-09						
Analyte		Results	Flag	MDL	PQL	Units	Method	Notes
Indeno(1,2,3-cd)pyrene		0.39		0.022	0.053	mg/kg dry	EPA 8270D	
Iron - Total		12200	B	0.764	3.98	mg/kg dry	EPA 6010C	QB-01
Lead - Total		14.8		0.191	0.796	mg/kg dry	EPA 6010C	
Manganese - Total		401		0.159	0.796	mg/kg dry	EPA 6010C	
Mercury - Total		0.0222		0.00971	0.0159	mg/kg dry	EPA 7471B	
Nickel - Total		5.45		0.573	3.98	mg/kg dry	EPA 6010C	
Phenanthrene		0.29		0.014	0.053	mg/kg dry	EPA 8270D	
Pyrene		0.80		0.018	0.053	mg/kg dry	EPA 8270D	
Total Organic Carbon		8500		800	800	mg/kg dry	Walkley Black Method	
Zinc - Total		57.7		1.75	3.98	mg/kg dry	EPA 6010C	

Client ID: D5		Lab ID: C109800-10						
Analyte		Results	Flag	MDL	PQL	Units	Method	Notes
Aluminum - Total		10900	B	4.13	19.7	mg/kg dry	EPA 6010C	QB-01
Arsenic - Total		2.88		0.197	0.984	mg/kg dry	EPA 6010C	
Benzo(a)anthracene		0.51		0.016	0.065	mg/kg dry	EPA 8270D	
Benzo(a)pyrene		0.88		0.014	0.065	mg/kg dry	EPA 8270D	
Benzo(b)fluoranthene		1.5		0.015	0.065	mg/kg dry	EPA 8270D	
Benzo(g,h,i)perylene		0.81		0.031	0.065	mg/kg dry	EPA 8270D	
Benzo(k)fluoranthene		0.50		0.014	0.065	mg/kg dry	EPA 8270D	
Chromium - Total		15.6		0.197	0.984	mg/kg dry	EPA 6010C	
Chrysene		1.0		0.018	0.065	mg/kg dry	EPA 8270D	
Copper - Total		19.5		0.374	0.984	mg/kg dry	EPA 6010C	
Dibenzo(a,h)anthracene		0.16		0.028	0.065	mg/kg dry	EPA 8270D	
Fluoranthene		1.7		0.022	0.065	mg/kg dry	EPA 8270D	
Indeno(1,2,3-cd)pyrene		0.72		0.028	0.065	mg/kg dry	EPA 8270D	
Iron - Total		16800	B	0.945	4.92	mg/kg dry	EPA 6010C	QB-01
Lead - Total		22.9		0.236	0.984	mg/kg dry	EPA 6010C	
Manganese - Total		777		0.197	0.984	mg/kg dry	EPA 6010C	
Mercury - Total		0.0398		0.0120	0.0197	mg/kg dry	EPA 7471B	
Nickel - Total		7.05		0.708	4.92	mg/kg dry	EPA 6010C	
Phenanthrene		0.49		0.017	0.065	mg/kg dry	EPA 8270D	
Pyrene		1.3		0.022	0.065	mg/kg dry	EPA 8270D	
Total Organic Carbon		23000		980	980	mg/kg dry	Walkley Black Method	
Zinc - Total		88.2		2.16	4.92	mg/kg dry	EPA 6010C	

ANALYTICAL RESULTS

Description: S22

Lab Sample ID: C109800-01

Received: 08/15/11 09:44

Matrix: Sediment

Sampled: 08/12/11 14:20

Work Order: C109800

Project: Neuse River

Sampled By: Tom Augspurger

% Solids: 66.0

Semivolatile Organic Compounds by GCMS SIM

[^] - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	Batch	Method	Analyzed	By	Notes
1-Methylnaphthalene [90-12-0] ^	0.012	U	mg/kg dry	1	0.012	0.050	1H16001	EPA 8270D	08/19/11 06:18	DFM	
2-Methylnaphthalene [91-57-6] ^	0.017	U	mg/kg dry	1	0.017	0.050	1H16001	EPA 8270D	08/19/11 06:18	DFM	
Acenaphthene [83-32-9] ^	0.023	U	mg/kg dry	1	0.023	0.050	1H16001	EPA 8270D	08/19/11 06:18	DFM	
Acenaphthylene [208-96-8] ^	0.013	U	mg/kg dry	1	0.013	0.050	1H16001	EPA 8270D	08/19/11 06:18	DFM	
Anthracene [120-12-7] ^	0.018	U	mg/kg dry	1	0.018	0.050	1H16001	EPA 8270D	08/19/11 06:18	DFM	
Benzo(a)anthracene [56-55-3] ^	0.012	U	mg/kg dry	1	0.012	0.050	1H16001	EPA 8270D	08/19/11 06:18	DFM	
Benzo(a)pyrene [50-32-8] ^	0.011	U	mg/kg dry	1	0.011	0.050	1H16001	EPA 8270D	08/19/11 06:18	DFM	
Benzo(b)fluoranthene [205-99-2] ^	0.056		mg/kg dry	1	0.012	0.050	1H16001	EPA 8270D	08/19/11 06:18	DFM	
Benzo(g,h,i)perylene [191-24-2] ^	0.024	U	mg/kg dry	1	0.024	0.050	1H16001	EPA 8270D	08/19/11 06:18	DFM	
Benzo(k)fluoranthene [207-08-9] ^	0.011	U	mg/kg dry	1	0.011	0.050	1H16001	EPA 8270D	08/19/11 06:18	DFM	
Chrysene [218-01-9] ^	0.013	U	mg/kg dry	1	0.013	0.050	1H16001	EPA 8270D	08/19/11 06:18	DFM	
Dibenz(a,h)anthracene [53-70-3] ^	0.021	U	mg/kg dry	1	0.021	0.050	1H16001	EPA 8270D	08/19/11 06:18	DFM	
Fluoranthene [206-44-0] ^	0.086		mg/kg dry	1	0.017	0.050	1H16001	EPA 8270D	08/19/11 06:18	DFM	
Fluorene [86-73-7] ^	0.013	U	mg/kg dry	1	0.013	0.050	1H16001	EPA 8270D	08/19/11 06:18	DFM	
Indeno(1,2,3-cd)pyrene [193-39-5] ^	0.021	U	mg/kg dry	1	0.021	0.050	1H16001	EPA 8270D	08/19/11 06:18	DFM	
Naphthalene [91-20-3] ^	0.013	U	mg/kg dry	1	0.013	0.050	1H16001	EPA 8270D	08/19/11 06:18	DFM	
Phenanthrene [85-01-8] ^	0.013	U	mg/kg dry	1	0.013	0.050	1H16001	EPA 8270D	08/19/11 06:18	DFM	
Pyrene [129-00-0] ^	0.066		mg/kg dry	1	0.017	0.050	1H16001	EPA 8270D	08/19/11 06:18	DFM	
Surrogates	Results	DF	Spike Lvl	% Rec	% Rec Limits		Batch	Method	Analyzed	By	Notes
p-Terphenyl	1.1	1	1.01	106 %	41-145		1H16001	EPA 8270D	08/19/11 06:18	DFM	

Description: S22**Lab Sample ID:** C109800-01**Received:** 08/15/11 09:44**Matrix:** Sediment**Sampled:** 08/12/11 14:20**Work Order:** C109800**Project:** Neuse River**Sampled By:** Tom Augspurger**% Solids:** 66.0**Metals by EPA 6000/7000 Series Methods***^ - ENCO Cary certified analyte [NC 591]*

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	Batch	Method	Analyzed	By	Notes
Aluminum [7429-90-5] ^	6720	B	mg/kg dry	1	3.18	15.2	1H16010	EPA 6010C	08/17/11 11:00	JDH	QB-01
Arsenic [7440-38-2] ^	1.51		mg/kg dry	1	0.152	0.758	1H16010	EPA 6010C	08/17/11 11:00	JDH	
Cadmium [7440-43-9] ^	0.0145	U	mg/kg dry	1	0.0145	0.0758	1H16010	EPA 6010C	08/17/11 11:00	JDH	
Chromium [7440-47-3] ^	13.9		mg/kg dry	1	0.152	0.758	1H16010	EPA 6010C	08/17/11 11:00	JDH	
Copper [7440-50-8] ^	8.34		mg/kg dry	1	0.288	0.758	1H16010	EPA 6010C	08/17/11 11:00	JDH	
Iron [7439-89-6] ^	10600	B	mg/kg dry	1	0.727	3.79	1H16010	EPA 6010C	08/17/11 11:00	JDH	QB-01
Lead [7439-92-1] ^	8.19		mg/kg dry	1	0.182	0.758	1H16010	EPA 6010C	08/17/11 11:00	JDH	
Manganese [7439-96-5] ^	489		mg/kg dry	1	0.152	0.758	1H16010	EPA 6010C	08/17/11 11:00	JDH	
Mercury [7439-97-6] ^	0.0188		mg/kg dry	1	0.00924	0.0152	1H16011	EPA 7471B	08/16/11 14:58	NLH	
Nickel [7440-02-0] ^	5.57		mg/kg dry	1	0.546	3.79	1H16010	EPA 6010C	08/17/11 11:00	JDH	
Zinc [7440-66-6] ^	33.3		mg/kg dry	1	1.67	3.79	1H16010	EPA 6010C	08/17/11 11:00	JDH	

Description: S22**Lab Sample ID:** C109800-01**Received:** 08/15/11 09:44**Matrix:** Sediment**Sampled:** 08/12/11 14:20**Work Order:** C109800**Project:** Neuse River**Sampled By:** Tom Augspurger**% Solids:** 66.0**Classical Chemistry Parameters**

<u>Analyte</u> [CAS Number]	<u>Results</u>	<u>Flag</u>	<u>Units</u>	<u>DF</u>	<u>MDL</u>	<u>MRL</u>	<u>Batch</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>
Total Organic Carbon [ECL-0165]	11000		mg/kg dry	1	760	760	1H17007	Nalkley Black Methoc	08/17/11 12:23	NP	

Description: S18A

Lab Sample ID: C109800-02

Received: 08/15/11 09:44

Matrix: Sediment

Sampled: 08/12/11 14:45

Work Order: C109800

Project: Neuse River

Sampled By: Tom Augspurger

% Solids: 49.5

Semivolatile Organic Compounds by GCMS SIM

[^] - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	Batch	Method	Analyzed	By	Notes
1-Methylnaphthalene [90-12-0] ^	0.016	U	mg/kg dry	1	0.016	0.067	1H16001	EPA 8270D	08/19/11 02:05	DFM	
2-Methylnaphthalene [91-57-6] ^	0.022	U	mg/kg dry	1	0.022	0.067	1H16001	EPA 8270D	08/19/11 02:05	DFM	
Acenaphthene [83-32-9] ^	0.030	U	mg/kg dry	1	0.030	0.067	1H16001	EPA 8270D	08/19/11 02:05	DFM	
Acenaphthylene [208-96-8] ^	0.018	U	mg/kg dry	1	0.018	0.067	1H16001	EPA 8270D	08/19/11 02:05	DFM	
Anthracene [120-12-7] ^	0.024	U	mg/kg dry	1	0.024	0.067	1H16001	EPA 8270D	08/19/11 02:05	DFM	
Benzo(a)anthracene [56-55-3] ^	0.016	U	mg/kg dry	1	0.016	0.067	1H16001	EPA 8270D	08/19/11 02:05	DFM	
Benzo(a)pyrene [50-32-8] ^	0.014	U	mg/kg dry	1	0.014	0.067	1H16001	EPA 8270D	08/19/11 02:05	DFM	
Benzo(b)fluoranthene [205-99-2] ^	0.074		mg/kg dry	1	0.016	0.067	1H16001	EPA 8270D	08/19/11 02:05	DFM	
Benzo(g,h,i)perylene [191-24-2] ^	0.032	U	mg/kg dry	1	0.032	0.067	1H16001	EPA 8270D	08/19/11 02:05	DFM	
Benzo(k)fluoranthene [207-08-9] ^	0.014	U	mg/kg dry	1	0.014	0.067	1H16001	EPA 8270D	08/19/11 02:05	DFM	
Chrysene [218-01-9] ^	0.018	U	mg/kg dry	1	0.018	0.067	1H16001	EPA 8270D	08/19/11 02:05	DFM	
Dibenzo(a,h)anthracene [53-70-3] ^	0.028	U	mg/kg dry	1	0.028	0.067	1H16001	EPA 8270D	08/19/11 02:05	DFM	
Fluoranthene [206-44-0] ^	0.087		mg/kg dry	1	0.022	0.067	1H16001	EPA 8270D	08/19/11 02:05	DFM	
Fluorene [86-73-7] ^	0.017	U	mg/kg dry	1	0.017	0.067	1H16001	EPA 8270D	08/19/11 02:05	DFM	
Indeno(1,2,3-cd)pyrene [193-39-5] ^	0.028	U	mg/kg dry	1	0.028	0.067	1H16001	EPA 8270D	08/19/11 02:05	DFM	
Naphthalene [91-20-3] ^	0.017	U	mg/kg dry	1	0.017	0.067	1H16001	EPA 8270D	08/19/11 02:05	DFM	
Phenanthrene [85-01-8] ^	0.017	U	mg/kg dry	1	0.017	0.067	1H16001	EPA 8270D	08/19/11 02:05	DFM	
Pyrene [129-00-0] ^	0.022	U	mg/kg dry	1	0.022	0.067	1H16001	EPA 8270D	08/19/11 02:05	DFM	
Surrogates	Results	DF	Spike Lvl	% Rec	% Rec Limits		Batch	Method	Analyzed	By	Notes
p-Terphenyl	1.3	1	1.35	97 %	41-145		1H16001	EPA 8270D	08/19/11 02:05	DFM	

Description: S18A**Lab Sample ID:** C109800-02**Received:** 08/15/11 09:44**Matrix:** Sediment**Sampled:** 08/12/11 14:45**Work Order:** C109800**Project:** Neuse River**Sampled By:** Tom Augspurger**% Solids:** 49.5**Metals by EPA 6000/7000 Series Methods***^ - ENCO Cary certified analyte [NC 591]*

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	Batch	Method	Analyzed	By	Notes
Aluminum [7429-90-5] ^	11200	B	mg/kg dry	1	4.24	20.2	1H16010	EPA 6010C	08/17/11 11:15	JDH	QB-01
Arsenic [7440-38-2] ^	2.53		mg/kg dry	1	0.202	1.01	1H16010	EPA 6010C	08/17/11 11:15	JDH	
Cadmium [7440-43-9] ^	0.0194	U	mg/kg dry	1	0.0194	0.101	1H16010	EPA 6010C	08/17/11 11:15	JDH	
Chromium [7440-47-3] ^	19.4		mg/kg dry	1	0.202	1.01	1H16010	EPA 6010C	08/17/11 11:15	JDH	
Copper [7440-50-8] ^	14.8		mg/kg dry	1	0.384	1.01	1H16010	EPA 6010C	08/17/11 11:15	JDH	
Iron [7439-89-6] ^	17900	B	mg/kg dry	1	0.969	5.05	1H16010	EPA 6010C	08/17/11 11:15	JDH	QB-01
Lead [7439-92-1] ^	13.4		mg/kg dry	1	0.242	1.01	1H16010	EPA 6010C	08/17/11 11:15	JDH	
Manganese [7439-96-5] ^	681		mg/kg dry	1	0.202	1.01	1H16010	EPA 6010C	08/17/11 11:15	JDH	
Mercury [7439-97-6] ^	0.0344		mg/kg dry	1	0.0123	0.0202	1H16011	EPA 7471B	08/16/11 15:10	NLH	
Nickel [7440-02-0] ^	8.96		mg/kg dry	1	0.727	5.05	1H16010	EPA 6010C	08/17/11 11:15	JDH	
Zinc [7440-66-6] ^	52.8		mg/kg dry	1	2.22	5.05	1H16010	EPA 6010C	08/17/11 11:15	JDH	

Description: S18A**Lab Sample ID:** C109800-02**Received:** 08/15/11 09:44**Matrix:** Sediment**Sampled:** 08/12/11 14:45**Work Order:** C109800**Project:** Neuse River**Sampled By:** Tom Augspurger**% Solids:** 49.5**Classical Chemistry Parameters**

<u>Analyte</u> [CAS Number]	<u>Results</u>	<u>Flag</u>	<u>Units</u>	<u>DF</u>	<u>MDL</u>	<u>MRL</u>	<u>Batch</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>
Total Organic Carbon [ECL-0165]	27000		mg/kg dry	1	1000	1000	1H17007	Nalkley Black Methoc	08/17/11 12:23	NP	

Description: S13

Lab Sample ID: C109800-03

Received: 08/15/11 09:44

Matrix: Sediment

Sampled: 08/12/11 11:50

Work Order: C109800

Project: Neuse River

Sampled By: Tom Augspurger

% Solids: 35.6

Semivolatile Organic Compounds by GCMS SIM

[^] - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	Batch	Method	Analyzed	By	Notes
1-Methylnaphthalene [90-12-0] ^	0.022	U	mg/kg dry	1	0.022	0.093	1H16001	EPA 8270D	08/19/11 02:33	DFM	
2-Methylnaphthalene [91-57-6] ^	0.031	U	mg/kg dry	1	0.031	0.093	1H16001	EPA 8270D	08/19/11 02:33	DFM	
Acenaphthene [83-32-9] ^	0.042	U	mg/kg dry	1	0.042	0.093	1H16001	EPA 8270D	08/19/11 02:33	DFM	
Acenaphthylene [208-96-8] ^	0.024	U	mg/kg dry	1	0.024	0.093	1H16001	EPA 8270D	08/19/11 02:33	DFM	
Anthracene [120-12-7] ^	0.034	U	mg/kg dry	1	0.034	0.093	1H16001	EPA 8270D	08/19/11 02:33	DFM	
Benzo(a)anthracene [56-55-3] ^	0.022	U	mg/kg dry	1	0.022	0.093	1H16001	EPA 8270D	08/19/11 02:33	DFM	
Benzo(a)pyrene [50-32-8] ^	0.094		mg/kg dry	1	0.020	0.093	1H16001	EPA 8270D	08/19/11 02:33	DFM	
Benzo(b)fluoranthene [205-99-2] ^	0.15		mg/kg dry	1	0.022	0.093	1H16001	EPA 8270D	08/19/11 02:33	DFM	
Benzo(g,h,i)perylene [191-24-2] ^	0.045	U	mg/kg dry	1	0.045	0.093	1H16001	EPA 8270D	08/19/11 02:33	DFM	
Benzo(k)fluoranthene [207-08-9] ^	0.020	U	mg/kg dry	1	0.020	0.093	1H16001	EPA 8270D	08/19/11 02:33	DFM	
Chrysene [218-01-9] ^	0.025	U	mg/kg dry	1	0.025	0.093	1H16001	EPA 8270D	08/19/11 02:33	DFM	
Dibenzo(a,h)anthracene [53-70-3] ^	0.039	U	mg/kg dry	1	0.039	0.093	1H16001	EPA 8270D	08/19/11 02:33	DFM	
Fluoranthene [206-44-0] ^	0.17		mg/kg dry	1	0.031	0.093	1H16001	EPA 8270D	08/19/11 02:33	DFM	
Fluorene [86-73-7] ^	0.024	U	mg/kg dry	1	0.024	0.093	1H16001	EPA 8270D	08/19/11 02:33	DFM	
Indeno(1,2,3-cd)pyrene [193-39-5] ^	0.039	U	mg/kg dry	1	0.039	0.093	1H16001	EPA 8270D	08/19/11 02:33	DFM	
Naphthalene [91-20-3] ^	0.024	U	mg/kg dry	1	0.024	0.093	1H16001	EPA 8270D	08/19/11 02:33	DFM	
Phenanthrene [85-01-8] ^	0.024	U	mg/kg dry	1	0.024	0.093	1H16001	EPA 8270D	08/19/11 02:33	DFM	
Pyrene [129-00-0] ^	0.13		mg/kg dry	1	0.031	0.093	1H16001	EPA 8270D	08/19/11 02:33	DFM	
Surrogates	Results	DF	Spike Lvl	% Rec	% Rec Limits		Batch	Method	Analyzed	By	Notes
p-Terphenyl	1.9	1	1.87	99 %	41-145		1H16001	EPA 8270D	08/19/11 02:33	DFM	

Description: S13

Lab Sample ID: C109800-03

Received: 08/15/11 09:44

Matrix: Sediment

Sampled: 08/12/11 11:50

Work Order: C109800

Project: Neuse River

Sampled By: Tom Augspurger

% Solids: 35.6

Metals by EPA 6000/7000 Series Methods
[^] - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	Batch	Method	Analyzed	By	Notes
Aluminum [7429-90-5] ^	18800	B	mg/kg dry	1	5.90	28.1	1H16010	EPA 6010C	08/17/11 11:17	JDH	QB-01
Arsenic [7440-38-2] ^	5.00		mg/kg dry	1	0.281	1.41	1H16010	EPA 6010C	08/17/11 11:17	JDH	
Cadmium [7440-43-9] ^	0.0270	U	mg/kg dry	1	0.0270	0.141	1H16010	EPA 6010C	08/17/11 11:17	JDH	
Chromium [7440-47-3] ^	28.9		mg/kg dry	1	0.281	1.41	1H16010	EPA 6010C	08/17/11 11:17	JDH	
Copper [7440-50-8] ^	25.4		mg/kg dry	1	0.534	1.41	1H16010	EPA 6010C	08/17/11 11:17	JDH	
Iron [7439-89-6] ^	27300	B	mg/kg dry	1	1.35	7.03	1H16010	EPA 6010C	08/17/11 11:17	JDH	QB-01
Lead [7439-92-1] ^	22.9		mg/kg dry	1	0.337	1.41	1H16010	EPA 6010C	08/17/11 11:17	JDH	
Manganese [7439-96-5] ^	995		mg/kg dry	1	0.281	1.41	1H16010	EPA 6010C	08/17/11 11:17	JDH	
Mercury [7439-97-6] ^	0.0647		mg/kg dry	1	0.0171	0.0281	1H16011	EPA 7471B	08/16/11 15:13	NLH	
Nickel [7440-02-0] ^	12.0		mg/kg dry	1	1.01	7.03	1H16010	EPA 6010C	08/17/11 11:17	JDH	
Zinc [7440-66-6] ^	151		mg/kg dry	1	3.09	7.03	1H16010	EPA 6010C	08/17/11 11:17	JDH	

Description: S13**Lab Sample ID:** C109800-03**Received:** 08/15/11 09:44**Matrix:** Sediment**Sampled:** 08/12/11 11:50**Work Order:** C109800**Project:** Neuse River**Sampled By:** Tom Augspurger**% Solids:** 35.6**Classical Chemistry Parameters**

<u>Analyte</u> [CAS Number]	<u>Results</u>	<u>Flag</u>	<u>Units</u>	<u>DF</u>	<u>MDL</u>	<u>MRL</u>	<u>Batch</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>
Total Organic Carbon [ECL-0165]	33000		mg/kg dry	1	1400	1400	1H17007	Nalkley Black Methoc	08/17/11 12:23	NP	

Description: S6

Lab Sample ID: C109800-04

Received: 08/15/11 09:44

Matrix: Sediment

Sampled: 08/12/11 08:55

Work Order: C109800

Project: Neuse River

Sampled By: Tom Augspurger

% Solids: 47.4

Semivolatile Organic Compounds by GCMS SIM

[^] - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	Batch	Method	Analyzed	By	Notes
1-Methylnaphthalene [90-12-0] ^	0.017	U	mg/kg dry	1	0.017	0.070	1H16001	EPA 8270D	08/19/11 03:01	DFM	
2-Methylnaphthalene [91-57-6] ^	0.023	U	mg/kg dry	1	0.023	0.070	1H16001	EPA 8270D	08/19/11 03:01	DFM	
Acenaphthene [83-32-9] ^	0.032	U	mg/kg dry	1	0.032	0.070	1H16001	EPA 8270D	08/19/11 03:01	DFM	
Acenaphthylene [208-96-8] ^	0.018	U	mg/kg dry	1	0.018	0.070	1H16001	EPA 8270D	08/19/11 03:01	DFM	
Anthracene [120-12-7] ^	0.025	U	mg/kg dry	1	0.025	0.070	1H16001	EPA 8270D	08/19/11 03:01	DFM	
Benzo(a)anthracene [56-55-3] ^	0.017	U	mg/kg dry	1	0.017	0.070	1H16001	EPA 8270D	08/19/11 03:01	DFM	
Benzo(a)pyrene [50-32-8] ^	0.015	U	mg/kg dry	1	0.015	0.070	1H16001	EPA 8270D	08/19/11 03:01	DFM	
Benzo(b)fluoranthene [205-99-2] ^	0.084		mg/kg dry	1	0.016	0.070	1H16001	EPA 8270D	08/19/11 03:01	DFM	
Benzo(g,h,i)perylene [191-24-2] ^	0.034	U	mg/kg dry	1	0.034	0.070	1H16001	EPA 8270D	08/19/11 03:01	DFM	
Benzo(k)fluoranthene [207-08-9] ^	0.015	U	mg/kg dry	1	0.015	0.070	1H16001	EPA 8270D	08/19/11 03:01	DFM	
Chrysene [218-01-9] ^	0.019	U	mg/kg dry	1	0.019	0.070	1H16001	EPA 8270D	08/19/11 03:01	DFM	
Dibenz(a,h)anthracene [53-70-3] ^	0.030	U	mg/kg dry	1	0.030	0.070	1H16001	EPA 8270D	08/19/11 03:01	DFM	
Fluoranthene [206-44-0] ^	0.098		mg/kg dry	1	0.023	0.070	1H16001	EPA 8270D	08/19/11 03:01	DFM	
Fluorene [86-73-7] ^	0.018	U	mg/kg dry	1	0.018	0.070	1H16001	EPA 8270D	08/19/11 03:01	DFM	
Indeno(1,2,3-cd)pyrene [193-39-5] ^	0.030	U	mg/kg dry	1	0.030	0.070	1H16001	EPA 8270D	08/19/11 03:01	DFM	
Naphthalene [91-20-3] ^	0.018	U	mg/kg dry	1	0.018	0.070	1H16001	EPA 8270D	08/19/11 03:01	DFM	
Phenanthrene [85-01-8] ^	0.018	U	mg/kg dry	1	0.018	0.070	1H16001	EPA 8270D	08/19/11 03:01	DFM	
Pyrene [129-00-0] ^	0.077		mg/kg dry	1	0.023	0.070	1H16001	EPA 8270D	08/19/11 03:01	DFM	

Surrogates	Results	DF	Spike Lvl	% Rec	% Rec Limits	Batch	Method	Analyzed	By	Notes
p-Terphenyl	1.3	1	1.41	93 %	41-145	1H16001	EPA 8270D	08/19/11 03:01	DFM	

Description: S6

Lab Sample ID: C109800-04

Received: 08/15/11 09:44

Matrix: Sediment

Sampled: 08/12/11 08:55

Work Order: C109800

Project: Neuse River

Sampled By: Tom Augspurger

% Solids: 47.4

Metals by EPA 6000/7000 Series Methods
[^] - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	Batch	Method	Analyzed	By	Notes
Aluminum [7429-90-5] ^	13200	B	mg/kg dry	1	4.43	21.1	1H16010	EPA 6010C	08/17/11 11:19	JDH	QB-01
Arsenic [7440-38-2] ^	3.34		mg/kg dry	1	0.211	1.06	1H16010	EPA 6010C	08/17/11 11:19	JDH	
Cadmium [7440-43-9] ^	0.0203	U	mg/kg dry	1	0.0203	0.106	1H16010	EPA 6010C	08/17/11 11:19	JDH	
Chromium [7440-47-3] ^	21.1		mg/kg dry	1	0.211	1.06	1H16010	EPA 6010C	08/17/11 11:19	JDH	
Copper [7440-50-8] ^	16.9		mg/kg dry	1	0.401	1.06	1H16010	EPA 6010C	08/17/11 11:19	JDH	
Iron [7439-89-6] ^	19500	B	mg/kg dry	1	1.01	5.28	1H16010	EPA 6010C	08/17/11 11:19	JDH	QB-01
Lead [7439-92-1] ^	15.2		mg/kg dry	1	0.253	1.06	1H16010	EPA 6010C	08/17/11 11:19	JDH	
Manganese [7439-96-5] ^	635		mg/kg dry	1	0.211	1.06	1H16010	EPA 6010C	08/17/11 11:19	JDH	
Mercury [7439-97-6] ^	0.0364		mg/kg dry	1	0.0129	0.0211	1H16011	EPA 7471B	08/16/11 15:16	NLH	
Nickel [7440-02-0] ^	9.30		mg/kg dry	1	0.760	5.28	1H16010	EPA 6010C	08/17/11 11:19	JDH	
Zinc [7440-66-6] ^	59.1		mg/kg dry	1	2.32	5.28	1H16010	EPA 6010C	08/17/11 11:19	JDH	

Description: S6**Lab Sample ID:** C109800-04**Received:** 08/15/11 09:44**Matrix:** Sediment**Sampled:** 08/12/11 08:55**Work Order:** C109800**Project:** Neuse River**Sampled By:** Tom Augspurger**% Solids:** 47.4**Classical Chemistry Parameters**

<u>Analyte</u> [CAS Number]	<u>Results</u>	<u>Flag</u>	<u>Units</u>	<u>DF</u>	<u>MDL</u>	<u>MRL</u>	<u>Batch</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>
Total Organic Carbon [ECL-0165]	23000		mg/kg dry	1	1100	1100	1H17007	Nalkley Black Methoc	08/17/11 12:23	NP	

Description: S6A

Lab Sample ID: C109800-05

Received: 08/15/11 09:44

Matrix: Sediment

Sampled: 08/12/11 08:45

Work Order: C109800

Project: Neuse River

Sampled By: Tom Augspurger

% Solids: 45.6

Semivolatile Organic Compounds by GCMS SIM

[^] - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	Batch	Method	Analyzed	By	Notes
1-Methylnaphthalene [90-12-0] ^	0.018	U	mg/kg dry	1	0.018	0.072	1H16001	EPA 8270D	08/19/11 03:29	DFM	
2-Methylnaphthalene [91-57-6] ^	0.024	U	mg/kg dry	1	0.024	0.072	1H16001	EPA 8270D	08/19/11 03:29	DFM	
Acenaphthene [83-32-9] ^	0.033	U	mg/kg dry	1	0.033	0.072	1H16001	EPA 8270D	08/19/11 03:29	DFM	
Acenaphthylene [208-96-8] ^	0.019	U	mg/kg dry	1	0.019	0.072	1H16001	EPA 8270D	08/19/11 03:29	DFM	
Anthracene [120-12-7] ^	0.026	U	mg/kg dry	1	0.026	0.072	1H16001	EPA 8270D	08/19/11 03:29	DFM	
Benzo(a)anthracene [56-55-3] ^	0.018	U	mg/kg dry	1	0.018	0.072	1H16001	EPA 8270D	08/19/11 03:29	DFM	
Benzo(a)pyrene [50-32-8] ^	0.015	U	mg/kg dry	1	0.015	0.072	1H16001	EPA 8270D	08/19/11 03:29	DFM	
Benzo(b)fluoranthene [205-99-2] ^	0.10		mg/kg dry	1	0.017	0.072	1H16001	EPA 8270D	08/19/11 03:29	DFM	
Benzo(g,h,i)perylene [191-24-2] ^	0.035	U	mg/kg dry	1	0.035	0.072	1H16001	EPA 8270D	08/19/11 03:29	DFM	
Benzo(k)fluoranthene [207-08-9] ^	0.015	U	mg/kg dry	1	0.015	0.072	1H16001	EPA 8270D	08/19/11 03:29	DFM	
Chrysene [218-01-9] ^	0.020	U	mg/kg dry	1	0.020	0.072	1H16001	EPA 8270D	08/19/11 03:29	DFM	
Dibenz(a,h)anthracene [53-70-3] ^	0.031	U	mg/kg dry	1	0.031	0.072	1H16001	EPA 8270D	08/19/11 03:29	DFM	
Fluoranthene [206-44-0] ^	0.10		mg/kg dry	1	0.024	0.072	1H16001	EPA 8270D	08/19/11 03:29	DFM	
Fluorene [86-73-7] ^	0.019	U	mg/kg dry	1	0.019	0.072	1H16001	EPA 8270D	08/19/11 03:29	DFM	
Indeno(1,2,3-cd)pyrene [193-39-5] ^	0.031	U	mg/kg dry	1	0.031	0.072	1H16001	EPA 8270D	08/19/11 03:29	DFM	
Naphthalene [91-20-3] ^	0.019	U	mg/kg dry	1	0.019	0.072	1H16001	EPA 8270D	08/19/11 03:29	DFM	
Phenanthrene [85-01-8] ^	0.019	U	mg/kg dry	1	0.019	0.072	1H16001	EPA 8270D	08/19/11 03:29	DFM	
Pyrene [129-00-0] ^	0.080		mg/kg dry	1	0.024	0.072	1H16001	EPA 8270D	08/19/11 03:29	DFM	

Surrogates	Results	DF	Spike Lvl	% Rec	% Rec Limits	Batch	Method	Analyzed	By	Notes
p-Terphenyl	1.4	1	1.46	96 %	41-145	1H16001	EPA 8270D	08/19/11 03:29	DFM	

Description: S6A

Lab Sample ID: C109800-05

Received: 08/15/11 09:44

Matrix: Sediment

Sampled: 08/12/11 08:45

Work Order: C109800

Project: Neuse River

Sampled By: Tom Augspurger

% Solids: 45.6

Metals by EPA 6000/7000 Series Methods
[^] - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	Batch	Method	Analyzed	By	Notes
Aluminum [7429-90-5] ^	14100	B	mg/kg dry	1	4.61	21.9	1H16010	EPA 6010C	08/17/11 11:20	JDH	QB-01
Arsenic [7440-38-2] ^	2.75		mg/kg dry	1	0.219	1.10	1H16010	EPA 6010C	08/17/11 11:20	JDH	
Cadmium [7440-43-9] ^	0.0211	U	mg/kg dry	1	0.0211	0.110	1H16010	EPA 6010C	08/17/11 11:20	JDH	
Chromium [7440-47-3] ^	22.6		mg/kg dry	1	0.219	1.10	1H16010	EPA 6010C	08/17/11 11:20	JDH	
Copper [7440-50-8] ^	17.9		mg/kg dry	1	0.417	1.10	1H16010	EPA 6010C	08/17/11 11:20	JDH	
Iron [7439-89-6] ^	20300	B	mg/kg dry	1	1.05	5.49	1H16010	EPA 6010C	08/17/11 11:20	JDH	QB-01
Lead [7439-92-1] ^	16.1		mg/kg dry	1	0.263	1.10	1H16010	EPA 6010C	08/17/11 11:20	JDH	
Manganese [7439-96-5] ^	603		mg/kg dry	1	0.219	1.10	1H16010	EPA 6010C	08/17/11 11:20	JDH	
Mercury [7439-97-6] ^	0.0464		mg/kg dry	1	0.0134	0.0219	1H16011	EPA 7471B	08/16/11 15:19	NLH	
Nickel [7440-02-0] ^	9.94		mg/kg dry	1	0.790	5.49	1H16010	EPA 6010C	08/17/11 11:20	JDH	
Zinc [7440-66-6] ^	64.2		mg/kg dry	1	2.41	5.49	1H16010	EPA 6010C	08/17/11 11:20	JDH	

Description: S6A**Lab Sample ID:** C109800-05**Received:** 08/15/11 09:44**Matrix:** Sediment**Sampled:** 08/12/11 08:45**Work Order:** C109800**Project:** Neuse River**Sampled By:** Tom Augspurger**% Solids:** 45.6**Classical Chemistry Parameters**

<u>Analyte</u> [CAS Number]	<u>Results</u>	<u>Flag</u>	<u>Units</u>	<u>DF</u>	<u>MDL</u>	<u>MRL</u>	<u>Batch</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>
Total Organic Carbon [ECL-0165]	27000		mg/kg dry	1	1100	1100	1H17007	Nalkley Black Methoc	08/17/11 12:23	NP	

Description: S2

Lab Sample ID: C109800-06

Received: 08/15/11 09:44

Matrix: Sediment

Sampled: 08/12/11 09:40

Work Order: C109800

Project: Neuse River

Sampled By: Tom Augspurger

% Solids: 28.3

Semivolatile Organic Compounds by GCMS SIM

[^] - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	Batch	Method	Analyzed	By	Notes
1-Methylnaphthalene [90-12-0] ^	0.028	U	mg/kg dry	1	0.028	0.12	1H16001	EPA 8270D	08/19/11 03:57	DFM	
2-Methylnaphthalene [91-57-6] ^	0.039	U	mg/kg dry	1	0.039	0.12	1H16001	EPA 8270D	08/19/11 03:57	DFM	
Acenaphthene [83-32-9] ^	0.053	U	mg/kg dry	1	0.053	0.12	1H16001	EPA 8270D	08/19/11 03:57	DFM	
Acenaphthylene [208-96-8] ^	0.031	U	mg/kg dry	1	0.031	0.12	1H16001	EPA 8270D	08/19/11 03:57	DFM	
Anthracene [120-12-7] ^	0.042	U	mg/kg dry	1	0.042	0.12	1H16001	EPA 8270D	08/19/11 03:57	DFM	
Benzo(a)anthracene [56-55-3] ^	0.028	U	mg/kg dry	1	0.028	0.12	1H16001	EPA 8270D	08/19/11 03:57	DFM	
Benzo(a)pyrene [50-32-8] ^	0.025	U	mg/kg dry	1	0.025	0.12	1H16001	EPA 8270D	08/19/11 03:57	DFM	
Benzo(b)fluoranthene [205-99-2] ^	0.028	U	mg/kg dry	1	0.028	0.12	1H16001	EPA 8270D	08/19/11 03:57	DFM	
Benzo(g,h,i)perylene [191-24-2] ^	0.056	U	mg/kg dry	1	0.056	0.12	1H16001	EPA 8270D	08/19/11 03:57	DFM	
Benzo(k)fluoranthene [207-08-9] ^	0.025	U	mg/kg dry	1	0.025	0.12	1H16001	EPA 8270D	08/19/11 03:57	DFM	
Chrysene [218-01-9] ^	0.031	U	mg/kg dry	1	0.031	0.12	1H16001	EPA 8270D	08/19/11 03:57	DFM	
Dibenzo(a,h)anthracene [53-70-3] ^	0.049	U	mg/kg dry	1	0.049	0.12	1H16001	EPA 8270D	08/19/11 03:57	DFM	
Fluoranthene [206-44-0] ^	0.039	U	mg/kg dry	1	0.039	0.12	1H16001	EPA 8270D	08/19/11 03:57	DFM	
Fluorene [86-73-7] ^	0.030	U	mg/kg dry	1	0.030	0.12	1H16001	EPA 8270D	08/19/11 03:57	DFM	
Indeno(1,2,3-cd)pyrene [193-39-5] ^	0.049	U	mg/kg dry	1	0.049	0.12	1H16001	EPA 8270D	08/19/11 03:57	DFM	
Naphthalene [91-20-3] ^	0.030	U	mg/kg dry	1	0.030	0.12	1H16001	EPA 8270D	08/19/11 03:57	DFM	
Phenanthrene [85-01-8] ^	0.030	U	mg/kg dry	1	0.030	0.12	1H16001	EPA 8270D	08/19/11 03:57	DFM	
Pyrene [129-00-0] ^	0.039	U	mg/kg dry	1	0.039	0.12	1H16001	EPA 8270D	08/19/11 03:57	DFM	
Surrogates	Results	DF	Spike Lvl	% Rec	% Rec Limits		Batch	Method	Analyzed	By	Notes
p-Terphenyl	1.9	1	2.35	80 %	41-145		1H16001	EPA 8270D	08/19/11 03:57	DFM	

Description: S2

Lab Sample ID: C109800-06

Received: 08/15/11 09:44

Matrix: Sediment

Sampled: 08/12/11 09:40

Work Order: C109800

Project: Neuse River

Sampled By: Tom Augspurger

% Solids: 28.3

Metals by EPA 6000/7000 Series Methods
[^] - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	Batch	Method	Analyzed	By	Notes
Aluminum [7429-90-5] ^	20900	B	mg/kg dry	1	7.42	35.3	1H16010	EPA 6010C	08/17/11 11:22	JDH	QB-01
Arsenic [7440-38-2] ^	3.76		mg/kg dry	1	0.353	1.77	1H16010	EPA 6010C	08/17/11 11:22	JDH	
Cadmium [7440-43-9] ^	0.0339	U	mg/kg dry	1	0.0339	0.177	1H16010	EPA 6010C	08/17/11 11:22	JDH	
Chromium [7440-47-3] ^	29.3		mg/kg dry	1	0.353	1.77	1H16010	EPA 6010C	08/17/11 11:22	JDH	
Copper [7440-50-8] ^	26.0		mg/kg dry	1	0.671	1.77	1H16010	EPA 6010C	08/17/11 11:22	JDH	
Iron [7439-89-6] ^	28000	B	mg/kg dry	1	1.69	8.83	1H16010	EPA 6010C	08/17/11 11:22	JDH	QB-01
Lead [7439-92-1] ^	23.3		mg/kg dry	1	0.424	1.77	1H16010	EPA 6010C	08/17/11 11:22	JDH	
Manganese [7439-96-5] ^	1030		mg/kg dry	1	0.353	1.77	1H16010	EPA 6010C	08/17/11 11:22	JDH	
Mercury [7439-97-6] ^	0.0573		mg/kg dry	1	0.0215	0.0353	1H16011	EPA 7471B	08/16/11 15:27	NLH	
Nickel [7440-02-0] ^	13.1		mg/kg dry	1	1.27	8.83	1H16010	EPA 6010C	08/17/11 11:22	JDH	
Zinc [7440-66-6] ^	93.9		mg/kg dry	1	3.88	8.83	1H16010	EPA 6010C	08/17/11 11:22	JDH	

Description: S2**Lab Sample ID:** C109800-06**Received:** 08/15/11 09:44**Matrix:** Sediment**Sampled:** 08/12/11 09:40**Work Order:** C109800**Project:** Neuse River**Sampled By:** Tom Augspurger**% Solids:** 28.3**Classical Chemistry Parameters**

<u>Analyte</u> [CAS Number]	<u>Results</u>	<u>Flag</u>	<u>Units</u>	<u>DF</u>	<u>MDL</u>	<u>MRL</u>	<u>Batch</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>
Total Organic Carbon [ECL-0165]	43000		mg/kg dry	1	1800	1800	1H17007	Nalkley Black Methoc	08/17/11 12:23	NP	

Description: D1

Lab Sample ID: C109800-07

Received: 08/15/11 09:44

Matrix: Sediment

Sampled: 08/11/11 14:55

Work Order: C109800

Project: Neuse River

Sampled By: Tom Augspurger

% Solids: 57.3

Semivolatile Organic Compounds by GCMS SIM

[^] - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	Batch	Method	Analyzed	By	Notes
1-Methylnaphthalene [90-12-0] ^	0.014	U	mg/kg dry	1	0.014	0.058	1H16001	EPA 8270D	08/19/11 04:26	DFM	
2-Methylnaphthalene [91-57-6] ^	0.019	U	mg/kg dry	1	0.019	0.058	1H16001	EPA 8270D	08/19/11 04:26	DFM	
Acenaphthene [83-32-9] ^	0.026	U	mg/kg dry	1	0.026	0.058	1H16001	EPA 8270D	08/19/11 04:26	DFM	
Acenaphthylene [208-96-8] ^	0.015	U	mg/kg dry	1	0.015	0.058	1H16001	EPA 8270D	08/19/11 04:26	DFM	
Anthracene [120-12-7] ^	0.021	U	mg/kg dry	1	0.021	0.058	1H16001	EPA 8270D	08/19/11 04:26	DFM	
Benzo(a)anthracene [56-55-3] ^	0.014	U	mg/kg dry	1	0.014	0.058	1H16001	EPA 8270D	08/19/11 04:26	DFM	
Benzo(a)pyrene [50-32-8] ^	0.064		mg/kg dry	1	0.012	0.058	1H16001	EPA 8270D	08/19/11 04:26	DFM	
Benzo(b)fluoranthene [205-99-2] ^	0.087		mg/kg dry	1	0.014	0.058	1H16001	EPA 8270D	08/19/11 04:26	DFM	
Benzo(g,h,i)perylene [191-24-2] ^	0.028	U	mg/kg dry	1	0.028	0.058	1H16001	EPA 8270D	08/19/11 04:26	DFM	
Benzo(k)fluoranthene [207-08-9] ^	0.012	U	mg/kg dry	1	0.012	0.058	1H16001	EPA 8270D	08/19/11 04:26	DFM	
Chrysene [218-01-9] ^	0.016	U	mg/kg dry	1	0.016	0.058	1H16001	EPA 8270D	08/19/11 04:26	DFM	
Dibenz(a,h)anthracene [53-70-3] ^	0.024	U	mg/kg dry	1	0.024	0.058	1H16001	EPA 8270D	08/19/11 04:26	DFM	
Fluoranthene [206-44-0] ^	0.093		mg/kg dry	1	0.019	0.058	1H16001	EPA 8270D	08/19/11 04:26	DFM	
Fluorene [86-73-7] ^	0.015	U	mg/kg dry	1	0.015	0.058	1H16001	EPA 8270D	08/19/11 04:26	DFM	
Indeno(1,2,3-cd)pyrene [193-39-5] ^	0.024	U	mg/kg dry	1	0.024	0.058	1H16001	EPA 8270D	08/19/11 04:26	DFM	
Naphthalene [91-20-3] ^	0.015	U	mg/kg dry	1	0.015	0.058	1H16001	EPA 8270D	08/19/11 04:26	DFM	
Phenanthrene [85-01-8] ^	0.015	U	mg/kg dry	1	0.015	0.058	1H16001	EPA 8270D	08/19/11 04:26	DFM	
Pyrene [129-00-0] ^	0.076		mg/kg dry	1	0.019	0.058	1H16001	EPA 8270D	08/19/11 04:26	DFM	
Surrogates	Results	DF	Spike Lvl	% Rec	% Rec Limits		Batch	Method	Analyzed	By	Notes
p-Terphenyl	1.2	1	1.16	102 %	41-145		1H16001	EPA 8270D	08/19/11 04:26	DFM	

Description: D1**Lab Sample ID:** C109800-07**Received:** 08/15/11 09:44**Matrix:** Sediment**Sampled:** 08/11/11 14:55**Work Order:** C109800**Project:** Neuse River**Sampled By:** Tom Augspurger**% Solids:** 57.3**Metals by EPA 6000/7000 Series Methods***^ - ENCO Cary certified analyte [NC 591]*

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	Batch	Method	Analyzed	By	Notes
Aluminum [7429-90-5] ^	9260	B	mg/kg dry	1	3.66	17.4	1H16010	EPA 6010C	08/17/11 11:24	JDH	QB-01
Arsenic [7440-38-2] ^	1.67		mg/kg dry	1	0.174	0.872	1H16010	EPA 6010C	08/17/11 11:24	JDH	
Cadmium [7440-43-9] ^	0.0167	U	mg/kg dry	1	0.0167	0.0872	1H16010	EPA 6010C	08/17/11 11:24	JDH	
Chromium [7440-47-3] ^	16.5		mg/kg dry	1	0.174	0.872	1H16010	EPA 6010C	08/17/11 11:24	JDH	
Copper [7440-50-8] ^	10.8		mg/kg dry	1	0.331	0.872	1H16010	EPA 6010C	08/17/11 11:24	JDH	
Iron [7439-89-6] ^	14500	B	mg/kg dry	1	0.837	4.36	1H16010	EPA 6010C	08/17/11 11:24	JDH	QB-01
Lead [7439-92-1] ^	10.9		mg/kg dry	1	0.209	0.872	1H16010	EPA 6010C	08/17/11 11:24	JDH	
Manganese [7439-96-5] ^	707		mg/kg dry	1	0.174	0.872	1H16010	EPA 6010C	08/17/11 11:24	JDH	
Mercury [7439-97-6] ^	0.0224		mg/kg dry	1	0.0106	0.0174	1H16011	EPA 7471B	08/16/11 15:30	NLH	
Nickel [7440-02-0] ^	7.02		mg/kg dry	1	0.628	4.36	1H16010	EPA 6010C	08/17/11 11:24	JDH	
Zinc [7440-66-6] ^	42.2		mg/kg dry	1	1.92	4.36	1H16010	EPA 6010C	08/17/11 11:24	JDH	

Description: D1**Lab Sample ID:** C109800-07**Received:** 08/15/11 09:44**Matrix:** Sediment**Sampled:** 08/11/11 14:55**Work Order:** C109800**Project:** Neuse River**Sampled By:** Tom Augspurger**% Solids:** 57.3**Classical Chemistry Parameters**

<u>Analyte</u> [CAS Number]	<u>Results</u>	<u>Flag</u>	<u>Units</u>	<u>DF</u>	<u>MDL</u>	<u>MRL</u>	<u>Batch</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>
Total Organic Carbon [ECL-0165]	16000		mg/kg dry	1	870	870	1H17007	Nalkley Black Methoc	08/17/11 12:23	NP	

Description: D3

Lab Sample ID: C109800-08

Received: 08/15/11 09:44

Matrix: Sediment

Sampled: 08/11/11 13:18

Work Order: C109800

Project: Neuse River

Sampled By: Tom Augspurger

% Solids: 59.6

Semivolatile Organic Compounds by GCMS SIM

[^] - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	Batch	Method	Analyzed	By	Notes
1-Methylnaphthalene [90-12-0] ^	0.013	U	mg/kg dry	1	0.013	0.055	1H16001	EPA 8270D	08/19/11 04:54	DFM	
2-Methylnaphthalene [91-57-6] ^	0.018	U	mg/kg dry	1	0.018	0.055	1H16001	EPA 8270D	08/19/11 04:54	DFM	
Acenaphthene [83-32-9] ^	0.025	U	mg/kg dry	1	0.025	0.055	1H16001	EPA 8270D	08/19/11 04:54	DFM	
Acenaphthylene [208-96-8] ^	0.015	U	mg/kg dry	1	0.015	0.055	1H16001	EPA 8270D	08/19/11 04:54	DFM	
Anthracene [120-12-7] ^	0.020	U	mg/kg dry	1	0.020	0.055	1H16001	EPA 8270D	08/19/11 04:54	DFM	
Benzo(a)anthracene [56-55-3] ^	0.20		mg/kg dry	1	0.013	0.055	1H16001	EPA 8270D	08/19/11 04:54	DFM	
Benzo(a)pyrene [50-32-8] ^	0.32		mg/kg dry	1	0.012	0.055	1H16001	EPA 8270D	08/19/11 04:54	DFM	
Benzo(b)fluoranthene [205-99-2] ^	0.53		mg/kg dry	1	0.013	0.055	1H16001	EPA 8270D	08/19/11 04:54	DFM	
Benzo(g,h,i)perylene [191-24-2] ^	0.29		mg/kg dry	1	0.027	0.055	1H16001	EPA 8270D	08/19/11 04:54	DFM	
Benzo(k)fluoranthene [207-08-9] ^	0.21		mg/kg dry	1	0.012	0.055	1H16001	EPA 8270D	08/19/11 04:54	DFM	
Chrysene [218-01-9] ^	0.34		mg/kg dry	1	0.015	0.055	1H16001	EPA 8270D	08/19/11 04:54	DFM	
Dibenzo(a,h)anthracene [53-70-3] ^	0.023	U	mg/kg dry	1	0.023	0.055	1H16001	EPA 8270D	08/19/11 04:54	DFM	
Fluoranthene [206-44-0] ^	0.61		mg/kg dry	1	0.018	0.055	1H16001	EPA 8270D	08/19/11 04:54	DFM	
Fluorene [86-73-7] ^	0.014	U	mg/kg dry	1	0.014	0.055	1H16001	EPA 8270D	08/19/11 04:54	DFM	
Indeno(1,2,3-cd)pyrene [193-39-5] ^	0.25		mg/kg dry	1	0.023	0.055	1H16001	EPA 8270D	08/19/11 04:54	DFM	
Naphthalene [91-20-3] ^	0.014	U	mg/kg dry	1	0.014	0.055	1H16001	EPA 8270D	08/19/11 04:54	DFM	
Phenanthrene [85-01-8] ^	0.17		mg/kg dry	1	0.014	0.055	1H16001	EPA 8270D	08/19/11 04:54	DFM	
Pyrene [129-00-0] ^	0.48		mg/kg dry	1	0.018	0.055	1H16001	EPA 8270D	08/19/11 04:54	DFM	
Surrogates	Results	DF	Spike Lvl	% Rec	% Rec Limits		Batch	Method	Analyzed	By	Notes
p-Terphenyl	1.1	1	1.12	101 %	41-145		1H16001	EPA 8270D	08/19/11 04:54	DFM	

Description: D3

Lab Sample ID: C109800-08

Received: 08/15/11 09:44

Matrix: Sediment

Sampled: 08/11/11 13:18

Work Order: C109800

Project: Neuse River

Sampled By: Tom Augspurger

% Solids: 59.6

Metals by EPA 6000/7000 Series Methods
[^] - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	Batch	Method	Analyzed	By	Notes
Aluminum [7429-90-5] ^	8260	B	mg/kg dry	1	3.52	16.8	1H16010	EPA 6010C	08/17/11 11:26	JDH	QB-01
Arsenic [7440-38-2] ^	1.88		mg/kg dry	1	0.168	0.838	1H16010	EPA 6010C	08/17/11 11:26	JDH	
Cadmium [7440-43-9] ^	0.0161	U	mg/kg dry	1	0.0161	0.0838	1H16010	EPA 6010C	08/17/11 11:26	JDH	
Chromium [7440-47-3] ^	13.8		mg/kg dry	1	0.168	0.838	1H16010	EPA 6010C	08/17/11 11:26	JDH	
Copper [7440-50-8] ^	14.3		mg/kg dry	1	0.319	0.838	1H16010	EPA 6010C	08/17/11 11:26	JDH	
Iron [7439-89-6] ^	12600	B	mg/kg dry	1	0.805	4.19	1H16010	EPA 6010C	08/17/11 11:26	JDH	QB-01
Lead [7439-92-1] ^	12.9		mg/kg dry	1	0.201	0.838	1H16010	EPA 6010C	08/17/11 11:26	JDH	
Manganese [7439-96-5] ^	492		mg/kg dry	1	0.168	0.838	1H16010	EPA 6010C	08/17/11 11:26	JDH	
Mercury [7439-97-6] ^	0.0276		mg/kg dry	1	0.0102	0.0168	1H16011	EPA 7471B	08/16/11 15:33	NLH	
Nickel [7440-02-0] ^	6.44		mg/kg dry	1	0.604	4.19	1H16010	EPA 6010C	08/17/11 11:26	JDH	
Zinc [7440-66-6] ^	50.8		mg/kg dry	1	1.84	4.19	1H16010	EPA 6010C	08/17/11 11:26	JDH	

Description: D3**Lab Sample ID:** C109800-08**Received:** 08/15/11 09:44**Matrix:** Sediment**Sampled:** 08/11/11 13:18**Work Order:** C109800**Project:** Neuse River**Sampled By:** Tom Augspurger**% Solids:** 59.6**Classical Chemistry Parameters**

<u>Analyte</u> [CAS Number]	<u>Results</u>	<u>Flag</u>	<u>Units</u>	<u>DF</u>	<u>MDL</u>	<u>MRL</u>	<u>Batch</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>
Total Organic Carbon [ECL-0165]	13000		mg/kg dry	1	840	840	1H17007	Nalkley Black Methoc	08/17/11 12:23	NP	

Description: D4

Lab Sample ID: C109800-09

Received: 08/15/11 09:44

Matrix: Sediment

Sampled: 08/11/11 11:21

Work Order: C109800

Project: Neuse River

Sampled By: Tom Augspurger

% Solids: 62.8

Semivolatile Organic Compounds by GCMS SIM

[^] - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	Batch	Method	Analyzed	By	Notes
1-Methylnaphthalene [90-12-0] ^	0.013	U	mg/kg dry	1	0.013	0.053	1H16001	EPA 8270D	08/19/11 05:22	DFM	
2-Methylnaphthalene [91-57-6] ^	0.018	U	mg/kg dry	1	0.018	0.053	1H16001	EPA 8270D	08/19/11 05:22	DFM	
Acenaphthene [83-32-9] ^	0.024	U	mg/kg dry	1	0.024	0.053	1H16001	EPA 8270D	08/19/11 05:22	DFM	
Acenaphthylene [208-96-8] ^	0.014	U	mg/kg dry	1	0.014	0.053	1H16001	EPA 8270D	08/19/11 05:22	DFM	
Anthracene [120-12-7] ^	0.019	U	mg/kg dry	1	0.019	0.053	1H16001	EPA 8270D	08/19/11 05:22	DFM	
Benzo(a)anthracene [56-55-3] ^	0.33		mg/kg dry	1	0.013	0.053	1H16001	EPA 8270D	08/19/11 05:22	DFM	
Benzo(a)pyrene [50-32-8] ^	0.55		mg/kg dry	1	0.011	0.053	1H16001	EPA 8270D	08/19/11 05:22	DFM	
Benzo(b)fluoranthene [205-99-2] ^	0.83		mg/kg dry	1	0.012	0.053	1H16001	EPA 8270D	08/19/11 05:22	DFM	
Benzo(g,h,i)perylene [191-24-2] ^	0.43		mg/kg dry	1	0.025	0.053	1H16001	EPA 8270D	08/19/11 05:22	DFM	
Benzo(k)fluoranthene [207-08-9] ^	0.36		mg/kg dry	1	0.011	0.053	1H16001	EPA 8270D	08/19/11 05:22	DFM	
Chrysene [218-01-9] ^	0.55		mg/kg dry	1	0.014	0.053	1H16001	EPA 8270D	08/19/11 05:22	DFM	
Dibenzo(a,h)anthracene [53-70-3] ^	0.090		mg/kg dry	1	0.022	0.053	1H16001	EPA 8270D	08/19/11 05:22	DFM	
Fluoranthene [206-44-0] ^	1.0		mg/kg dry	1	0.018	0.053	1H16001	EPA 8270D	08/19/11 05:22	DFM	
Fluorene [86-73-7] ^	0.014	U	mg/kg dry	1	0.014	0.053	1H16001	EPA 8270D	08/19/11 05:22	DFM	
Indeno(1,2,3-cd)pyrene [193-39-5] ^	0.39		mg/kg dry	1	0.022	0.053	1H16001	EPA 8270D	08/19/11 05:22	DFM	
Naphthalene [91-20-3] ^	0.014	U	mg/kg dry	1	0.014	0.053	1H16001	EPA 8270D	08/19/11 05:22	DFM	
Phenanthrene [85-01-8] ^	0.29		mg/kg dry	1	0.014	0.053	1H16001	EPA 8270D	08/19/11 05:22	DFM	
Pyrene [129-00-0] ^	0.80		mg/kg dry	1	0.018	0.053	1H16001	EPA 8270D	08/19/11 05:22	DFM	

Surrogates	Results	DF	Spike Lvl	% Rec	% Rec Limits	Batch	Method	Analyzed	By	Notes
p-Terphenyl	1.2	1	1.06	109 %	41-145	1H16001	EPA 8270D	08/19/11 05:22	DFM	

Description: D4

Lab Sample ID: C109800-09

Received: 08/15/11 09:44

Matrix: Sediment

Sampled: 08/11/11 11:21

Work Order: C109800

Project: Neuse River

Sampled By: Tom Augspurger

% Solids: 62.8

Metals by EPA 6000/7000 Series Methods
[^] - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	Batch	Method	Analyzed	By	Notes
Aluminum [7429-90-5] ^	7810	B	mg/kg dry	1	3.34	15.9	1H16010	EPA 6010C	08/17/11 11:28	JDH	QB-01
Arsenic [7440-38-2] ^	1.76		mg/kg dry	1	0.159	0.796	1H16010	EPA 6010C	08/17/11 11:28	JDH	
Cadmium [7440-43-9] ^	0.0153	U	mg/kg dry	1	0.0153	0.0796	1H16010	EPA 6010C	08/17/11 11:28	JDH	
Chromium [7440-47-3] ^	11.3		mg/kg dry	1	0.159	0.796	1H16010	EPA 6010C	08/17/11 11:28	JDH	
Copper [7440-50-8] ^	11.9		mg/kg dry	1	0.302	0.796	1H16010	EPA 6010C	08/17/11 11:28	JDH	
Iron [7439-89-6] ^	12200	B	mg/kg dry	1	0.764	3.98	1H16010	EPA 6010C	08/17/11 11:28	JDH	QB-01
Lead [7439-92-1] ^	14.8		mg/kg dry	1	0.191	0.796	1H16010	EPA 6010C	08/17/11 11:28	JDH	
Manganese [7439-96-5] ^	401		mg/kg dry	1	0.159	0.796	1H16010	EPA 6010C	08/17/11 11:28	JDH	
Mercury [7439-97-6] ^	0.0222		mg/kg dry	1	0.00971	0.0159	1H16011	EPA 7471B	08/16/11 15:36	NLH	
Nickel [7440-02-0] ^	5.45		mg/kg dry	1	0.573	3.98	1H16010	EPA 6010C	08/17/11 11:28	JDH	
Zinc [7440-66-6] ^	57.7		mg/kg dry	1	1.75	3.98	1H16010	EPA 6010C	08/17/11 11:28	JDH	

Description: D4**Lab Sample ID:** C109800-09**Received:** 08/15/11 09:44**Matrix:** Sediment**Sampled:** 08/11/11 11:21**Work Order:** C109800**Project:** Neuse River**Sampled By:** Tom Augspurger**% Solids:** 62.8**Classical Chemistry Parameters**

<u>Analyte</u> [CAS Number]	<u>Results</u>	<u>Flag</u>	<u>Units</u>	<u>DF</u>	<u>MDL</u>	<u>MRL</u>	<u>Batch</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>
Total Organic Carbon [ECL-0165]	8500		mg/kg dry	1	800	800	1H17007	Nalkley Black Methoc	08/17/11 12:23	NP	

Description: D5

Lab Sample ID: C109800-10

Received: 08/15/11 09:44

Matrix: Sediment

Sampled: 08/11/11 09:45

Work Order: C109800

Project: Neuse River

Sampled By: Tom Augspurger

% Solids: 50.8

Semivolatile Organic Compounds by GCMS SIM
[^] - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	Batch	Method	Analyzed	By	Notes
1-Methylnaphthalene [90-12-0] ^	0.016	U	mg/kg dry	1	0.016	0.065	1H16001	EPA 8270D	08/19/11 05:50	DFM	
2-Methylnaphthalene [91-57-6] ^	0.022	U	mg/kg dry	1	0.022	0.065	1H16001	EPA 8270D	08/19/11 05:50	DFM	
Acenaphthene [83-32-9] ^	0.030	U	mg/kg dry	1	0.030	0.065	1H16001	EPA 8270D	08/19/11 05:50	DFM	
Acenaphthylene [208-96-8] ^	0.017	U	mg/kg dry	1	0.017	0.065	1H16001	EPA 8270D	08/19/11 05:50	DFM	
Anthracene [120-12-7] ^	0.024	U	mg/kg dry	1	0.024	0.065	1H16001	EPA 8270D	08/19/11 05:50	DFM	
Benzo(a)anthracene [56-55-3] ^	0.51		mg/kg dry	1	0.016	0.065	1H16001	EPA 8270D	08/19/11 05:50	DFM	
Benzo(a)pyrene [50-32-8] ^	0.88		mg/kg dry	1	0.014	0.065	1H16001	EPA 8270D	08/19/11 05:50	DFM	
Benzo(b)fluoranthene [205-99-2] ^	1.5		mg/kg dry	1	0.015	0.065	1H16001	EPA 8270D	08/19/11 05:50	DFM	
Benzo(g,h,i)perylene [191-24-2] ^	0.81		mg/kg dry	1	0.031	0.065	1H16001	EPA 8270D	08/19/11 05:50	DFM	
Benzo(k)fluoranthene [207-08-9] ^	0.50		mg/kg dry	1	0.014	0.065	1H16001	EPA 8270D	08/19/11 05:50	DFM	
Chrysene [218-01-9] ^	1.0		mg/kg dry	1	0.018	0.065	1H16001	EPA 8270D	08/19/11 05:50	DFM	
Dibenzo(a,h)anthracene [53-70-3] ^	0.16		mg/kg dry	1	0.028	0.065	1H16001	EPA 8270D	08/19/11 05:50	DFM	
Fluoranthene [206-44-0] ^	1.7		mg/kg dry	1	0.022	0.065	1H16001	EPA 8270D	08/19/11 05:50	DFM	
Fluorene [86-73-7] ^	0.017	U	mg/kg dry	1	0.017	0.065	1H16001	EPA 8270D	08/19/11 05:50	DFM	
Indeno(1,2,3-cd)pyrene [193-39-5] ^	0.72		mg/kg dry	1	0.028	0.065	1H16001	EPA 8270D	08/19/11 05:50	DFM	
Naphthalene [91-20-3] ^	0.017	U	mg/kg dry	1	0.017	0.065	1H16001	EPA 8270D	08/19/11 05:50	DFM	
Phenanthrene [85-01-8] ^	0.49		mg/kg dry	1	0.017	0.065	1H16001	EPA 8270D	08/19/11 05:50	DFM	
Pyrene [129-00-0] ^	1.3		mg/kg dry	1	0.022	0.065	1H16001	EPA 8270D	08/19/11 05:50	DFM	

Surrogates	Results	DF	Spike Lvl	% Rec	% Rec Limits	Batch	Method	Analyzed	By	Notes
p-Terphenyl	1.4	1	1.31	104 %	41-145	1H16001	EPA 8270D	08/19/11 05:50	DFM	

Description: D5**Lab Sample ID:** C109800-10**Received:** 08/15/11 09:44**Matrix:** Sediment**Sampled:** 08/11/11 09:45**Work Order:** C109800**Project:** Neuse River**Sampled By:** Tom Augspurger**% Solids:** 50.8**Metals by EPA 6000/7000 Series Methods***^ - ENCO Cary certified analyte [NC 591]*

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	Batch	Method	Analyzed	By	Notes
Aluminum [7429-90-5] ^	10900	B	mg/kg dry	1	4.13	19.7	1H16010	EPA 6010C	08/17/11 11:30	JDH	QB-01
Arsenic [7440-38-2] ^	2.88		mg/kg dry	1	0.197	0.984	1H16010	EPA 6010C	08/17/11 11:30	JDH	
Cadmium [7440-43-9] ^	0.0189	U	mg/kg dry	1	0.0189	0.0984	1H16010	EPA 6010C	08/17/11 11:30	JDH	
Chromium [7440-47-3] ^	15.6		mg/kg dry	1	0.197	0.984	1H16010	EPA 6010C	08/17/11 11:30	JDH	
Copper [7440-50-8] ^	19.5		mg/kg dry	1	0.374	0.984	1H16010	EPA 6010C	08/17/11 11:30	JDH	
Iron [7439-89-6] ^	16800	B	mg/kg dry	1	0.945	4.92	1H16010	EPA 6010C	08/17/11 11:30	JDH	QB-01
Lead [7439-92-1] ^	22.9		mg/kg dry	1	0.236	0.984	1H16010	EPA 6010C	08/17/11 11:30	JDH	
Manganese [7439-96-5] ^	777		mg/kg dry	1	0.197	0.984	1H16010	EPA 6010C	08/17/11 11:30	JDH	
Mercury [7439-97-6] ^	0.0398		mg/kg dry	1	0.0120	0.0197	1H16011	EPA 7471B	08/16/11 15:39	NLH	
Nickel [7440-02-0] ^	7.05		mg/kg dry	1	0.708	4.92	1H16010	EPA 6010C	08/17/11 11:30	JDH	
Zinc [7440-66-6] ^	88.2		mg/kg dry	1	2.16	4.92	1H16010	EPA 6010C	08/17/11 11:30	JDH	

Description: D5**Lab Sample ID:** C109800-10**Received:** 08/15/11 09:44**Matrix:** Sediment**Sampled:** 08/11/11 09:45**Work Order:** C109800**Project:** Neuse River**Sampled By:** Tom Augspurger**% Solids:** 50.8**Classical Chemistry Parameters**

<u>Analyte</u> [CAS Number]	<u>Results</u>	<u>Flag</u>	<u>Units</u>	<u>DF</u>	<u>MDL</u>	<u>MRL</u>	<u>Batch</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>
Total Organic Carbon [ECL-0165]	23000		mg/kg dry	1	980	980	1H17007	Nalkley Black Methoc	08/17/11 12:23	NP	

QUALITY CONTROL

Semivolatile Organic Compounds by GCMS SIM - Quality Control

Batch 1H16001 - EPA 3550C_MS

Blank (1H16001-BLK1)

Prepared: 08/16/2011 05:17 Analyzed: 08/19/2011 01:09

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1-Methylnaphthalene	0.0080	U	0.033	mg/kg wet							
2-Methylnaphthalene	0.011	U	0.033	mg/kg wet							
Acenaphthene	0.015	U	0.033	mg/kg wet							
Acenaphthylene	0.0087	U	0.033	mg/kg wet							
Anthracene	0.012	U	0.033	mg/kg wet							
Benzo(a)anthracene	0.0080	U	0.033	mg/kg wet							
Benzo(a)pyrene	0.0070	U	0.033	mg/kg wet							
Benzo(b)fluoranthene	0.0078	U	0.033	mg/kg wet							
Benzo(g,h,i)perylene	0.016	U	0.033	mg/kg wet							
Benzo(k)fluoranthene	0.0070	U	0.033	mg/kg wet							
Chrysene	0.0089	U	0.033	mg/kg wet							
Dibenz(a,h)anthracene	0.014	U	0.033	mg/kg wet							
Fluoranthene	0.011	U	0.033	mg/kg wet							
Fluorene	0.0086	U	0.033	mg/kg wet							
Indeno(1,2,3-cd)pyrene	0.014	U	0.033	mg/kg wet							
Naphthalene	0.0086	U	0.033	mg/kg wet							
Phenanthrene	0.0086	U	0.033	mg/kg wet							
Pyrene	0.011	U	0.033	mg/kg wet							
<i>Surrogate: p-Terphenyl</i>	<i>0.61</i>			mg/kg wet	0.667			92	41-145		

LCS (1H16001-BS1)

Prepared: 08/16/2011 05:17 Analyzed: 08/19/2011 01:37

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Acenaphthene	0.59		0.033	mg/kg wet	0.667		88	64-131			
Benzo(a)pyrene	0.54		0.033	mg/kg wet	0.667		81	60-137			
Naphthalene	0.55		0.033	mg/kg wet	0.667		83	59-129			
<i>Surrogate: p-Terphenyl</i>	<i>0.67</i>			mg/kg wet	0.667		100	41-145			

Matrix Spike (1H16001-MS1)

Prepared: 08/16/2011 05:17 Analyzed: 08/19/2011 06:46

Source: C109800-01

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Acenaphthene	0.95		0.050	mg/kg dry	1.01	0.023 U	94	64-131			
Benzo(a)pyrene	1.3		0.050	mg/kg dry	1.01	0.011 U	125	60-137			
Naphthalene	0.85		0.050	mg/kg dry	1.01	0.013 U	85	59-129			
<i>Surrogate: p-Terphenyl</i>	<i>1.1</i>			mg/kg dry	1.01		112	41-145			

Matrix Spike Dup (1H16001-MSD1)

Prepared: 08/16/2011 05:17 Analyzed: 08/19/2011 15:09

Source: C109800-01

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Acenaphthene	0.91		0.050	mg/kg dry	1.01	0.023 U	91	64-131	4	19	
Benzo(a)pyrene	1.1		0.050	mg/kg dry	1.01	0.011 U	112	60-137	11	50	
Naphthalene	0.85		0.050	mg/kg dry	1.01	0.013 U	84	59-129	0.6	21	
<i>Surrogate: p-Terphenyl</i>	<i>1.0</i>			mg/kg dry	1.01		100	41-145			

QUALITY CONTROL

Metals by EPA 6000/7000 Series Methods - Quality Control

Batch 1H16010 - EPA 3050B

Blank (1H16010-BLK1)

Prepared: 08/16/2011 13:00 Analyzed: 08/17/2011 10:55

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Aluminum	3.75	J	10.0	mg/kg wet							
Arsenic	0.100	U	0.500	mg/kg wet							
Cadmium	0.00960	U	0.0500	mg/kg wet							
Chromium	0.100	U	0.500	mg/kg wet							
Copper	0.190	U	0.500	mg/kg wet							
Iron	2.28	J	2.50	mg/kg wet							
Lead	0.120	U	0.500	mg/kg wet							
Manganese	0.100	U	0.500	mg/kg wet							
Nickel	0.360	U	2.50	mg/kg wet							
Zinc	1.10	U	2.50	mg/kg wet							

LCS (1H16010-BS1)

Prepared: 08/16/2011 13:00 Analyzed: 08/17/2011 10:58

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Aluminum	106	B	10.0	mg/kg wet	100		106	80-120			
Arsenic	9.73		0.500	mg/kg wet	10.0		97	80-120			
Cadmium	1.03		0.0500	mg/kg wet	1.00		103	80-120			
Chromium	10.1		0.500	mg/kg wet	10.0		101	80-120			
Copper	9.96		0.500	mg/kg wet	10.0		100	80-120			
Iron	56.8	B	2.50	mg/kg wet	50.0		114	80-120			
Lead	9.87		0.500	mg/kg wet	10.0		99	80-120			
Manganese	10.0		0.500	mg/kg wet	10.0		100	80-120			
Nickel	10.4		2.50	mg/kg wet	10.0		104	80-120			
Zinc	10.5		2.50	mg/kg wet	10.0		105	80-120			

Matrix Spike (1H16010-MS1)

Prepared: 08/16/2011 13:00 Analyzed: 08/17/2011 11:02

Source: C109800-01

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Aluminum	9850	B	15.2	mg/kg dry	152	6720	NR	75-125			QM-07
Arsenic	15.3		0.758	mg/kg dry	15.2	1.51	91	75-125			
Cadmium	1.50		0.0758	mg/kg dry	1.52	0.0145 U	99	75-125			
Chromium	29.6		0.758	mg/kg dry	15.2	13.9	103	75-125			
Copper	24.5		0.758	mg/kg dry	15.2	8.34	107	75-125			
Iron	11500	B	3.79	mg/kg dry	75.8	10600	NR	75-125			QM-07
Lead	22.7		0.758	mg/kg dry	15.2	8.19	96	75-125			
Manganese	524		0.758	mg/kg dry	15.2	489	231	75-125			QM-07
Nickel	21.7		3.79	mg/kg dry	15.2	5.57	107	75-125			
Zinc	50.0		3.79	mg/kg dry	15.2	33.3	110	75-125			

Matrix Spike Dup (1H16010-MSD1)

Prepared: 08/16/2011 13:00 Analyzed: 08/17/2011 11:04

Source: C109800-01

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Aluminum	9480	B	15.2	mg/kg dry	150	6720	NR	75-125	4	20	QM-07
Arsenic	15.1		0.758	mg/kg dry	15.0	1.51	91	75-125	1	20	
Cadmium	1.44		0.0758	mg/kg dry	1.50	0.0145 U	96	75-125	5	20	
Chromium	28.2		0.758	mg/kg dry	15.0	13.9	95	75-125	5	20	

QUALITY CONTROL

Metals by EPA 6000/7000 Series Methods - Quality Control

Batch 1H16010 - EPA 3050B

Matrix Spike Dup (1H16010-MSD1) Continued

Prepared: 08/16/2011 13:00 Analyzed: 08/17/2011 11:04

Source: C109800-01

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Copper	23.6		0.758	mg/kg dry	15.0	8.34	102	75-125	3	20	
Iron	11000	B	3.79	mg/kg dry	75.0	10600	537	75-125	4	20	QM-07
Lead	21.9		0.758	mg/kg dry	15.0	8.19	91	75-125	4	20	
Manganese	538		0.758	mg/kg dry	15.0	489	331	75-125	3	20	QM-07
Nickel	21.2		3.79	mg/kg dry	15.0	5.57	104	75-125	2	20	
Zinc	47.6		3.79	mg/kg dry	15.0	33.3	95	75-125	5	20	

Post Spike (1H16010-PS1)

Prepared: 08/16/2011 13:00 Analyzed: 08/17/2011 11:06

Source: C109800-01

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Aluminum	89.0	B	0.200	mg/L	2.00	88.7	12	80-120			QM-08
Arsenic	0.209		0.0100	mg/L	0.200	0.0199	95	80-120			
Cadmium	0.0196		0.00100	mg/L	0.0200	-0.000350	100	80-120			
Chromium	0.381		0.0100	mg/L	0.200	0.184	99	80-120			
Copper	0.310		0.0100	mg/L	0.200	0.110	100	80-120			
Iron	139	B	0.0500	mg/L	1.00	140	NR	80-120			QM-08
Lead	0.300		0.0100	mg/L	0.200	0.108	96	80-120			
Manganese	6.51		0.0100	mg/L	0.200	6.45	30	80-120			QM-08
Nickel	0.273		0.0500	mg/L	0.200	0.0735	100	80-120			
Zinc	0.610		0.0500	mg/L	0.200	0.440	85	80-120			

Batch 1H16011 - EPA 7471B

Blank (1H16011-BLK1)

Prepared: 08/16/2011 10:07 Analyzed: 08/16/2011 14:52

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Mercury	0.00610	U	0.0100	mg/kg wet							

LCS (1H16011-BS1)

Prepared: 08/16/2011 10:07 Analyzed: 08/16/2011 14:55

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Mercury	0.282		0.0100	mg/kg wet	0.254		111	85-115			

Matrix Spike (1H16011-MS1)

Prepared: 08/16/2011 10:07 Analyzed: 08/16/2011 15:01

Source: C109800-01

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Mercury	0.387		0.0152	mg/kg dry	0.373	0.0188	99	80-120			

Matrix Spike Dup (1H16011-MSD1)

Prepared: 08/16/2011 10:07 Analyzed: 08/16/2011 15:04

Source: C109800-01

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Mercury	0.389		0.0152	mg/kg dry	0.373	0.0188	99	80-120	0.6	20	

QUALITY CONTROL

Metals by EPA 6000/7000 Series Methods - Quality Control

Batch 1H16011 - EPA 7471B

Post Spike (1H16011-PS1)

Prepared: 08/16/2011 10:07 Analyzed: 08/16/2011 15:07

Source: C109800-01

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Mercury	6.39		0.200	ug/L	5.00	0.253	123	75-125			

QUALITY CONTROL

Classical Chemistry Parameters - Quality Control

Batch 1H17007 - NO PREP

Blank (1H17007-BLK1)

Prepared: 08/17/2011 10:07 Analyzed: 08/17/2011 12:23

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Total Organic Carbon	500	U	500	mg/kg wet							

LCS (1H17007-BS1)

Prepared: 08/17/2011 10:07 Analyzed: 08/17/2011 12:23

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Total Organic Carbon	8600		500	mg/kg wet	9990		86.1	50-150			

Matrix Spike (1H17007-MS1)

Prepared: 08/17/2011 10:07 Analyzed: 08/17/2011 12:23

Source: C109800-01

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Total Organic Carbon	22000		760	mg/kg dry	13400	11000	86.1	50-150			

Matrix Spike Dup (1H17007-MSD1)

Prepared: 08/17/2011 10:07 Analyzed: 08/17/2011 12:23

Source: C109800-01

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Total Organic Carbon	23000		760	mg/kg dry	15100	11000	78.0	50-150	1.23	25	

FLAGS/NOTES AND DEFINITIONS

- B The analyte was detected in the associated method blank.
- D The sample was analyzed at dilution.
- J The reported value is between the laboratory method detection limit (MDL) and the laboratory method reporting limit (MRL), adjusted for actual sample preparation data and moisture content, where applicable.
- U The analyte was analyzed for but not detected to the level shown, adjusted for actual sample preparation data and moisture content, where applicable.
- E The concentration indicated for this analyte is an estimated value above the calibration range of the instrument. This value is considered an estimate.
- MRL Method Reporting Limit. The MRL is roughly equivalent to the practical quantitation limit (PQL) and is based on the low point of the calibration curve, when applicable, sample preparation factor, dilution factor, and, in the case of soil samples, moisture content.
- QB-01 The method blank had a positive result for the analyte; however, the concentration in the method blank is less than 10% of the sample result, which minimizes the impact of the deviation.
- QM-07 The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
- QM-08 Post-digestion spike did not meet method requirements due to confirmed matrix effects (dilution test).



ENVIRONMENTAL CONSERVATION LABORATORIES CHAIN-OF-CUSTODY RECORD

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Cary, NC 27511
(919) 467-3000 Fax (919) 467-3515Page 1 of 1

Client Name RiverBank Ecosystems (R010)		Project Number Neuse River		Requested Analyses												Requested Turnaround Times				
Address PO Box 29921		Project Name/Desc. Neuse River														Note - Rush requests subject to acceptance by the facility				
City/ST/Zip Austin, TX 78755		PO # / Billing Info														<input type="checkbox"/> Standard				
Tel (512) 241-3775	Fax	Reporting Contact Adam Riggsbee														<input type="checkbox"/> Expedited				
Sampler(s) Name, Affiliation (Print) <i>Tom Haughey, USFWS - Raleigh 919-856-4520 ext 109 919-744-8510 (cell)</i>		Billing Contact Adam Riggsbee														Due <u>/ /</u>				
																Lab Workorder C109800				
																Preservation (See Codes) (Combine as necessary)				
Item #	Sample ID (Field Identification)			Collection Date	Collection Time	Comp / Grab	Matrix (see codes)	Total # of Containers	Sample Comments											
S22				08-12-2011	1420	Comp	SE	2	X	X										
S18A				08-12-2011	1445	Comp	SE	2	X	X										
S13				08-12-2011	1150	Comp	SE	2	X	X										
S6				08-12-2011	0855	Comp	SE	2	X	X										
S6A				08-12-2011	0845	Comp	SE	2	X	X										
S2				08-12-2011	0940	Comp	SE	2	X	X										
D1				08-11-2011	1455	Comp	SE	2	X	X										
D3				08-11-2011	1318	Comp	SE	2	X	X										
D4				08-11-2011	1121	Comp	SE	2	X	X										
D5				08-11-2011	0945	Comp	SE	2	X	X										
																<-- Total # of Containers				
Sample Kit Prepared By		Date/Time		Relinquished By		Received By		Date/Time		Date/Time		Date/Time		Date/Time		Date/Time				
				<i>J. Haughey</i>		<i>J. Haughey</i>		<i>John C.</i>		<i>John C.</i>		<i>John C.</i>		<i>John C.</i>		<i>John C.</i>				
Comments/Special Reporting Requirements				Relinquished By		Received By		Date/Time		Date/Time		Date/Time		Date/Time		Date/Time				
Cooler #'s & Temps on Receipt		C-79949 13°C														Condition Upon Receipt				
																<input checked="" type="checkbox"/> Acceptable				
																<input type="checkbox"/> Unacceptable				

Matrix : GW-Groundwater SO-Soil DW-Drinking Water WW-Wastewater SE-Sediment SW-Surface Water H-HCl N-HNO3 S-H2SO4 NO-NOx O-Oxygen (detail in comments)
 Note : All samples submitted to ENCO Labs are in accordance with the terms and conditions listed on the reverse of this form, unless prior written agreements exist

Environmental Conservation Laboratories, Inc.

102-A Woodwinds Industrial Court

Cary NC, 27511

Phone: 919.467.3090 FAX: 919.467.3515



www.encolabs.com

Tuesday, September 20, 2011

RiverBank Ecosystems (RI010)

Attn: Adam Riggsbee

PO Box 29921

Austin, TX 78755

RE: Laboratory Results for

Project Number: Neuse River, Project Name/Desc: Neuse River

ENCO Workorder: C109801

Dear Adam Riggsbee,

Enclosed is a copy of your laboratory report for test samples received by our laboratory on Tuesday, August 23, 2011.

Unless otherwise noted in an attached project narrative, all samples were received in acceptable condition and processed in accordance with the referenced methods/procedures. Results for these procedures apply only to the samples as submitted.

The analytical results contained in this report are in compliance with NELAC standards, except as noted in the project narrative. This report shall not be reproduced except in full, without the written approval of the Laboratory.

This report contains only those analyses performed by Environmental Conservation Laboratories. Unless otherwise noted, all analyses were performed at ENCO Cary. Data from outside organizations will be reported under separate cover.

If you have any questions or require further information, please do not hesitate to contact me.

Sincerely,

A handwritten signature in black ink that reads "Chuck Smith".

Chuck Smith

Project Manager

Enclosure(s)

SAMPLE SUMMARY/LABORATORY CHRONICLE

Client ID: S22E		Lab ID: C109801-01	Sampled: 08/17/11 10:00	Received: 08/23/11 11:05
Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)	
EPA 6020A	02/13/12	08/24/11 09:10	9/16/2011 13:35	
SM 2340 B	05/12/14	08/24/11 09:07	8/25/2011 10:21	
Client ID: S18AE		Lab ID: C109801-02	Sampled: 08/17/11 10:00	Received: 08/23/11 11:05
Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)	
EPA 6020A	02/13/12	08/24/11 09:10	9/16/2011 13:40	
SM 2340 B	05/12/14	08/24/11 09:07	8/25/2011 10:27	
Client ID: S13E		Lab ID: C109801-03	Sampled: 08/17/11 10:00	Received: 08/23/11 11:05
Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)	
EPA 6020A	02/13/12	08/24/11 09:10	9/16/2011 13:44	
SM 2340 B	05/12/14	08/24/11 09:07	8/25/2011 10:29	
Client ID: S6E		Lab ID: C109801-04	Sampled: 08/17/11 13:00	Received: 08/23/11 11:05
Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)	
EPA 6020A	02/13/12	08/24/11 09:10	9/16/2011 13:48	
SM 2340 B	05/12/14	08/24/11 09:07	8/25/2011 10:37	
Client ID: S6E		Lab ID: C109801-04RE1	Sampled: 08/17/11 13:00	Received: 08/23/11 11:05
Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)	
EPA 6020A	02/13/12	08/24/11 09:10	9/16/2011 15:24	
Client ID: S6AE		Lab ID: C109801-05	Sampled: 08/17/11 13:00	Received: 08/23/11 11:05
Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)	
EPA 6020A	02/13/12	08/24/11 09:10	9/16/2011 12:54	
SM 2340 B	05/12/14	08/24/11 09:07	8/25/2011 10:39	
Client ID: S6AE		Lab ID: C109801-05RE1	Sampled: 08/17/11 13:00	Received: 08/23/11 11:05
Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)	
EPA 6020A	02/13/12	08/24/11 09:10	9/16/2011 13:10	
Client ID: S2E		Lab ID: C109801-06	Sampled: 08/17/11 13:00	Received: 08/23/11 11:05
Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)	
EPA 6020A	02/13/12	08/24/11 09:10	9/16/2011 13:52	
SM 2340 B	05/12/14	08/24/11 09:07	8/25/2011 10:41	



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Client ID:	D1E	Lab ID:	C109801-07	Sampled:	08/17/11 13:30	Received:	08/23/11 11:05
Parameter		Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)	
EPA 6020A		02/13/12		08/24/11	09:10	9/16/2011	14:08
SM 2340 B		05/12/14		08/24/11	09:07	8/25/2011	10:43

Client ID:	D1E	Lab ID:	C109801-07RE1	Sampled:	08/17/11 13:30	Received:	08/23/11 11:05
Parameter		Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)	
EPA 6020A		02/13/12		08/24/11	09:10	9/16/2011	15:28

Client ID:	D3E	Lab ID:	C109801-08	Sampled:	08/17/11 13:00	Received:	08/23/11 11:05
Parameter		Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)	
EPA 6020A		02/13/12		08/24/11	09:10	9/16/2011	14:13
SM 2340 B		05/12/14		08/24/11	09:07	8/25/2011	10:45

Client ID:	D4E	Lab ID:	C109801-09	Sampled:	08/17/11 14:00	Received:	08/23/11 11:05
Parameter		Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)	
EPA 6020A		02/13/12		08/24/11	09:10	9/16/2011	14:17
SM 2340 B		05/12/14		08/24/11	09:07	8/25/2011	10:47

Client ID:	D5E	Lab ID:	C109801-10	Sampled:	08/17/11 14:00	Received:	08/23/11 11:05
Parameter		Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)	
EPA 6020A		02/13/12		08/24/11	09:10	9/16/2011	14:21
SM 2340 B		05/12/14		08/24/11	09:07	8/25/2011	10:49

Client ID:	D3E EXTRA	Lab ID:	C109801-11	Sampled:	08/17/11 13:00	Received:	08/23/11 11:05
Parameter		Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)	
EPA 6020A		02/13/12		08/24/11	09:10	9/16/2011	14:25
SM 2340 B		05/12/14		08/24/11	09:07	8/25/2011	10:51

Client ID:	D5E EXTRA	Lab ID:	C109801-12	Sampled:	08/17/11 14:00	Received:	08/23/11 11:05
Parameter		Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)	
EPA 6020A		02/13/12		08/24/11	09:10	9/16/2011	14:29
SM 2340 B		05/12/14		08/24/11	09:07	8/25/2011	10:53

Client ID:	S22P	Lab ID:	C109801-13	Sampled:	08/18/11 14:00	Received:	08/23/11 11:05
Parameter		Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)	
EPA 6020A		02/14/12		08/24/11	09:10	9/16/2011	14:33
SM 2340 B		05/13/14		08/24/11	09:07	8/25/2011	10:56

Client ID:	S18AP	Lab ID:	C109801-14	Sampled:	08/18/11 14:00	Received:	08/23/11 11:05
Parameter		Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)	
EPA 6020A		02/14/12		08/24/11	09:10	9/16/2011	14:37
SM 2340 B		05/13/14		08/24/11	09:07	8/25/2011	11:03

Client ID:	S13P	Lab ID:	C109801-15	Sampled:	08/18/11 14:00	Received:	08/23/11 11:05
Parameter		Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)	
EPA 6020A		02/14/12		08/24/11	09:10	9/16/2011	14:41
SM 2340 B		05/13/14		08/24/11	09:07	8/25/2011	11:05

Client ID:	S6P	Lab ID:	C109801-16	Sampled:	08/18/11 14:00	Received:	08/23/11 11:05
Parameter		Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)	
EPA 6020A		02/14/12		08/24/11	09:10	9/16/2011	14:46
SM 2340 B		05/13/14		08/24/11	09:07	8/25/2011	11:07

Client ID:	S6AP	Lab ID:	C109801-17	Sampled:	08/18/11 14:00	Received:	08/23/11 11:05
Parameter		Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)	
EPA 6020A		02/14/12		08/24/11	09:10	9/16/2011	15:03
SM 2340 B		05/13/14		08/24/11	09:07	8/25/2011	11:09

Client ID:	S2P	Lab ID:	C109801-18	Sampled:	08/18/11 14:00	Received:	08/23/11 11:05
Parameter		Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)	
EPA 6020A		02/14/12		08/24/11	09:10	9/16/2011	15:07
SM 2340 B		05/13/14		08/24/11	09:07	8/25/2011	11:11

Client ID:	D1P	Lab ID:	C109801-19	Sampled:	08/18/11 14:00	Received:	08/23/11 11:05
Parameter		Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)	
EPA 6020A		02/14/12		08/24/11	09:10	9/16/2011	15:11
SM 2340 B		05/13/14		08/24/11	09:07	8/25/2011	11:13

Client ID:	D3P	Lab ID:	C109801-20	Sampled:	08/18/11 14:00	Received:	08/23/11 11:05
Parameter		Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)	
EPA 6020A		02/14/12		08/24/11	09:10	9/16/2011	15:15
SM 2340 B		05/13/14		08/24/11	09:07	8/25/2011	11:15

Client ID:	D4P	Lab ID:	C109801-21	Sampled:	08/18/11 14:00	Received:	08/23/11 11:05
Parameter		Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)	
EPA 6020A		02/14/12		08/25/11	10:02	9/15/2011	13:21
SM 2340 B		05/13/14		08/25/11	09:54	8/26/2011	11:29



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Client ID:	D5P	Lab ID:	C109801-22	Sampled:	08/18/11 14:00	Received:	08/23/11 11:05
Parameter		Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)	
EPA 6020A		02/14/12		08/25/11	10:02	9/15/2011	13:46
SM 2340 B		05/13/14		08/25/11	09:54	8/26/2011	11:31

Client ID:	D5PW EXTRA	Lab ID:	C109801-23	Sampled:	08/18/11 14:00	Received:	08/23/11 11:05
Parameter		Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)	
EPA 6020A		02/14/12		08/25/11	10:02	9/15/2011	13:50
SM 2340 B		05/13/14		08/25/11	09:54	8/26/2011	11:33

Client ID:	D3PW EXTRA	Lab ID:	C109801-24	Sampled:	08/18/11 14:00	Received:	08/23/11 11:05
Parameter		Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)	
EPA 6020A		02/14/12		08/25/11	10:02	9/15/2011	14:06
SM 2340 B		05/13/14		08/25/11	09:54	8/26/2011	11:35

SAMPLE DETECTION SUMMARY

Client ID: S22E		Lab ID: C109801-01						
Analyte		Results	Flag	MDL	PQL	Units	Method	Notes
Chromium - Total		6.33	JBD	4.50	10.0	ug/L	EPA 6020A	J
Copper - Total		9.64	JD	1.00	10.0	ug/L	EPA 6020A	
Hardness - Total		54		0.018	2.5	mg/L	SM 2340 B	
Lead - Total		688	D	1.00	10.0	ug/L	EPA 6020A	
Nickel - Total		6.18	JBD	1.00	10.0	ug/L	EPA 6020A	QB-01
Zinc - Total		26.3	JBD	3.20	50.0	ug/L	EPA 6020A	QB-01
Client ID: S18AE		Lab ID: C109801-02						
Analyte		Results	Flag	MDL	PQL	Units	Method	Notes
Chromium - Total		7.37	JBD	4.50	10.0	ug/L	EPA 6020A	J
Copper - Total		12.9	D	1.00	10.0	ug/L	EPA 6020A	
Hardness - Total		52		0.018	2.5	mg/L	SM 2340 B	
Lead - Total		4770	D	1.00	10.0	ug/L	EPA 6020A	
Nickel - Total		11.7	BD	1.00	10.0	ug/L	EPA 6020A	QB-01
Zinc - Total		29.9	JBD	3.20	50.0	ug/L	EPA 6020A	QB-01
Client ID: S13E		Lab ID: C109801-03						
Analyte		Results	Flag	MDL	PQL	Units	Method	Notes
Chromium - Total		4.52	JBD	4.50	10.0	ug/L	EPA 6020A	J
Copper - Total		6.18	JD	1.00	10.0	ug/L	EPA 6020A	
Hardness - Total		61		0.018	2.5	mg/L	SM 2340 B	
Lead - Total		591	D	1.00	10.0	ug/L	EPA 6020A	
Nickel - Total		4.39	JBD	1.00	10.0	ug/L	EPA 6020A	QB-01
Zinc - Total		26.8	JBD	3.20	50.0	ug/L	EPA 6020A	QB-01
Client ID: S6E		Lab ID: C109801-04						
Analyte		Results	Flag	MDL	PQL	Units	Method	Notes
Chromium - Total		6.99	JBD	4.50	10.0	ug/L	EPA 6020A	J
Copper - Total		13.8	D	1.00	10.0	ug/L	EPA 6020A	
Hardness - Total		60		0.018	2.5	mg/L	SM 2340 B	
Nickel - Total		10.9	BD	1.00	10.0	ug/L	EPA 6020A	QB-01
Zinc - Total		46.2	JBD	3.20	50.0	ug/L	EPA 6020A	QB-01
Client ID: S6E		Lab ID: C109801-04RE1						
Analyte		Results	Flag	MDL	PQL	Units	Method	Notes
Lead - Total		5050	D	2.00	20.0	ug/L	EPA 6020A	
Client ID: S6AE		Lab ID: C109801-05						
Analyte		Results	Flag	MDL	PQL	Units	Method	Notes
Arsenic - Total		0.729	J	0.470	1.00	ug/L	EPA 6020A	
Cadmium - Total		0.163	J	0.100	1.00	ug/L	EPA 6020A	
Chromium - Total		5.33	JB	0.450	1.00	ug/L	EPA 6020A	J
Copper - Total		10.8		0.100	1.00	ug/L	EPA 6020A	
Hardness - Total		50		0.018	2.5	mg/L	SM 2340 B	
Nickel - Total		4.63	B	0.100	1.00	ug/L	EPA 6020A	QB-01
Zinc - Total		17.4	B	0.320	5.00	ug/L	EPA 6020A	QB-01

Client ID: S6AE		Lab ID: C109801-05RE1						
Analyte		Results	Flag	MDL	PQL	Units	Method	Notes
Lead - Total		1860	D	0.500	5.00	ug/L	EPA 6020A	
Client ID: S2E		Lab ID: C109801-06						
Analyte		Results	Flag	MDL	PQL	Units	Method	Notes
Copper - Total		7.35	JD	1.00	10.0	ug/L	EPA 6020A	
Hardness - Total		68		0.018	2.5	mg/L	SM 2340 B	
Lead - Total		2220	D	1.00	10.0	ug/L	EPA 6020A	
Nickel - Total		9.48	JBD	1.00	10.0	ug/L	EPA 6020A	QB-01
Zinc - Total		19.3	JBD	3.20	50.0	ug/L	EPA 6020A	QB-01
Client ID: D1E		Lab ID: C109801-07						
Analyte		Results	Flag	MDL	PQL	Units	Method	Notes
Chromium - Total		11.6	BD	4.50	10.0	ug/L	EPA 6020A	QB-01
Copper - Total		17.5	D	1.00	10.0	ug/L	EPA 6020A	
Hardness - Total		56		0.018	2.5	mg/L	SM 2340 B	
Nickel - Total		29.9	BD	1.00	10.0	ug/L	EPA 6020A	QB-01
Zinc - Total		41.6	JBD	3.20	50.0	ug/L	EPA 6020A	QB-01
Client ID: D1E		Lab ID: C109801-07RE1						
Analyte		Results	Flag	MDL	PQL	Units	Method	Notes
Lead - Total		12200	D	10.0	100	ug/L	EPA 6020A	
Client ID: D3E		Lab ID: C109801-08						
Analyte		Results	Flag	MDL	PQL	Units	Method	Notes
Copper - Total		6.20	JD	1.00	10.0	ug/L	EPA 6020A	
Hardness - Total		71		0.018	2.5	mg/L	SM 2340 B	
Lead - Total		660	D	1.00	10.0	ug/L	EPA 6020A	
Nickel - Total		7.33	JBD	1.00	10.0	ug/L	EPA 6020A	QB-01
Zinc - Total		25.1	JBD	3.20	50.0	ug/L	EPA 6020A	QB-01
Client ID: D4E		Lab ID: C109801-09						
Analyte		Results	Flag	MDL	PQL	Units	Method	Notes
Chromium - Total		4.53	JBD	4.50	10.0	ug/L	EPA 6020A	J
Copper - Total		6.60	JD	1.00	10.0	ug/L	EPA 6020A	
Hardness - Total		82		0.018	2.5	mg/L	SM 2340 B	
Lead - Total		326	D	1.00	10.0	ug/L	EPA 6020A	
Nickel - Total		4.80	JBD	1.00	10.0	ug/L	EPA 6020A	QB-01
Zinc - Total		40.3	JBD	3.20	50.0	ug/L	EPA 6020A	QB-01
Client ID: D5E		Lab ID: C109801-10						
Analyte		Results	Flag	MDL	PQL	Units	Method	Notes
Copper - Total		8.34	JD	1.00	10.0	ug/L	EPA 6020A	
Hardness - Total		130		0.018	2.5	mg/L	SM 2340 B	
Lead - Total		2110	D	1.00	10.0	ug/L	EPA 6020A	
Nickel - Total		8.79	JBD	1.00	10.0	ug/L	EPA 6020A	QB-01
Zinc - Total		37.5	JBD	3.20	50.0	ug/L	EPA 6020A	QB-01
Client ID: D3E EXTRA		Lab ID: C109801-11						
Analyte		Results	Flag	MDL	PQL	Units	Method	Notes
Hardness - Total		28		0.018	2.5	mg/L	SM 2340 B	
Lead - Total		4.91	JD	1.00	10.0	ug/L	EPA 6020A	

Client ID: D3E EXTRA		Lab ID: C109801-11						
Analyte		Results	Flag	MDL	PQL	Units	Method	Notes
Nickel - Total		3.06	JB	1.00	10.0	ug/L	EPA 6020A	QB-01
Zinc - Total		11.7	JB	3.20	50.0	ug/L	EPA 6020A	QB-01
Client ID: D5E EXTRA		Lab ID: C109801-12						
Analyte		Results	Flag	MDL	PQL	Units	Method	Notes
Hardness - Total		38		0.018	2.5	mg/L	SM 2340 B	
Lead - Total		5.50	JD	1.00	10.0	ug/L	EPA 6020A	
Nickel - Total		30.8	BD	1.00	10.0	ug/L	EPA 6020A	QB-01
Zinc - Total		7.29	JB	3.20	50.0	ug/L	EPA 6020A	QB-01
Client ID: S22P		Lab ID: C109801-13						
Analyte		Results	Flag	MDL	PQL	Units	Method	Notes
Copper - Total		1.19	JD	1.00	10.0	ug/L	EPA 6020A	
Hardness - Total		12		0.018	2.5	mg/L	SM 2340 B	
Lead - Total		6.67	JD	1.00	10.0	ug/L	EPA 6020A	
Nickel - Total		4.52	JB	1.00	10.0	ug/L	EPA 6020A	QB-01
Zinc - Total		4.14	JB	3.20	50.0	ug/L	EPA 6020A	J
Client ID: S18AP		Lab ID: C109801-14						
Analyte		Results	Flag	MDL	PQL	Units	Method	Notes
Copper - Total		1.10	JD	1.00	10.0	ug/L	EPA 6020A	
Hardness - Total		21		0.018	2.5	mg/L	SM 2340 B	
Lead - Total		7.00	JD	1.00	10.0	ug/L	EPA 6020A	
Zinc - Total		20.8	JB	3.20	50.0	ug/L	EPA 6020A	QB-01
Client ID: S13P		Lab ID: C109801-15						
Analyte		Results	Flag	MDL	PQL	Units	Method	Notes
Copper - Total		1.07	JD	1.00	10.0	ug/L	EPA 6020A	
Hardness - Total		33		0.018	2.5	mg/L	SM 2340 B	
Lead - Total		6.01	JD	1.00	10.0	ug/L	EPA 6020A	
Nickel - Total		2.36	JB	1.00	10.0	ug/L	EPA 6020A	QB-01
Zinc - Total		9.76	JB	3.20	50.0	ug/L	EPA 6020A	QB-01
Client ID: S6P		Lab ID: C109801-16						
Analyte		Results	Flag	MDL	PQL	Units	Method	Notes
Copper - Total		2.27	JD	1.00	10.0	ug/L	EPA 6020A	
Hardness - Total		34		0.018	2.5	mg/L	SM 2340 B	
Lead - Total		7.13	JD	1.00	10.0	ug/L	EPA 6020A	
Nickel - Total		1.91	JB	1.00	10.0	ug/L	EPA 6020A	QB-01
Zinc - Total		4.09	JB	3.20	50.0	ug/L	EPA 6020A	J
Client ID: S6AP		Lab ID: C109801-17						
Analyte		Results	Flag	MDL	PQL	Units	Method	Notes
Copper - Total		4.00	JD	1.00	10.0	ug/L	EPA 6020A	
Hardness - Total		23		0.018	2.5	mg/L	SM 2340 B	
Lead - Total		8.42	JD	1.00	10.0	ug/L	EPA 6020A	
Nickel - Total		2.11	JB	1.00	10.0	ug/L	EPA 6020A	QB-01
Zinc - Total		17.8	JB	3.20	50.0	ug/L	EPA 6020A	QB-01
Client ID: S2P		Lab ID: C109801-18						
Analyte		Results	Flag	MDL	PQL	Units	Method	Notes



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Client ID: S2P		Lab ID: C109801-18					
Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Copper - Total	2.66	JD	1.00	10.0	ug/L	EPA 6020A	
Hardness - Total	38		0.018	2.5	mg/L	SM 2340 B	
Lead - Total	7.20	JD	1.00	10.0	ug/L	EPA 6020A	
Nickel - Total	2.22	JBD	1.00	10.0	ug/L	EPA 6020A	QB-01
Zinc - Total	19.1	JBD	3.20	50.0	ug/L	EPA 6020A	QB-01
Client ID: D1P		Lab ID: C109801-19					
Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Hardness - Total	19		0.018	2.5	mg/L	SM 2340 B	
Lead - Total	5.73	JD	1.00	10.0	ug/L	EPA 6020A	
Nickel - Total	3.20	JBD	1.00	10.0	ug/L	EPA 6020A	QB-01
Client ID: D3P		Lab ID: C109801-20					
Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Copper - Total	4.29	JD	1.00	10.0	ug/L	EPA 6020A	
Hardness - Total	29		0.018	2.5	mg/L	SM 2340 B	
Lead - Total	6.63	JD	1.00	10.0	ug/L	EPA 6020A	
Nickel - Total	3.68	JBD	1.00	10.0	ug/L	EPA 6020A	QB-01
Zinc - Total	25.6	JBD	3.20	50.0	ug/L	EPA 6020A	QB-01
Client ID: D4P		Lab ID: C109801-21					
Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Arsenic - Total	1.40		0.470	1.00	ug/L	EPA 6020A	
Chromium - Total	1.43	JB	0.450	1.00	ug/L	EPA 6020A	J
Copper - Total	0.557	J	0.100	1.00	ug/L	EPA 6020A	
Hardness - Total	40		0.018	2.5	mg/L	SM 2340 B	
Lead - Total	0.638	J	0.100	1.00	ug/L	EPA 6020A	
Nickel - Total	0.923	JB	0.100	1.00	ug/L	EPA 6020A	J
Zinc - Total	2.59	JB	0.320	5.00	ug/L	EPA 6020A	J
Client ID: D5P		Lab ID: C109801-22					
Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Arsenic - Total	2.41		0.470	1.00	ug/L	EPA 6020A	
Cadmium - Total	0.123	J	0.100	1.00	ug/L	EPA 6020A	
Chromium - Total	1.46	JB	0.450	1.00	ug/L	EPA 6020A	J
Copper - Total	0.936	J	0.100	1.00	ug/L	EPA 6020A	
Hardness - Total	76		0.018	2.5	mg/L	SM 2340 B	
Lead - Total	1.12		0.100	1.00	ug/L	EPA 6020A	
Nickel - Total	1.07	JB	0.100	1.00	ug/L	EPA 6020A	J
Zinc - Total	2.08	JB	0.320	5.00	ug/L	EPA 6020A	J
Client ID: D5PW EXTRA		Lab ID: C109801-23					
Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Arsenic - Total	3.27		0.470	1.00	ug/L	EPA 6020A	
Cadmium - Total	0.186	J	0.100	1.00	ug/L	EPA 6020A	
Chromium - Total	1.42	JB	0.450	1.00	ug/L	EPA 6020A	J
Copper - Total	0.160	J	0.100	1.00	ug/L	EPA 6020A	
Hardness - Total	150		0.018	2.5	mg/L	SM 2340 B	
Lead - Total	0.153	J	0.100	1.00	ug/L	EPA 6020A	
Nickel - Total	1.70	JB	0.100	1.00	ug/L	EPA 6020A	J
Selenium - Total	1.09		0.830	1.00	ug/L	EPA 6020A	

Client ID: D5PW EXTRA		Lab ID: C109801-23						
Analyte		Results	Flag	MDL	PQL	Units	Method	Notes
Zinc - Total		6.38	JB	0.320	5.00	ug/L	EPA 6020A	J

Client ID: D3PW EXTRA		Lab ID: C109801-24						
Analyte		Results	Flag	MDL	PQL	Units	Method	Notes
Arsenic - Total		0.931	J	0.470	1.00	ug/L	EPA 6020A	
Cadmium - Total		0.106	J	0.100	1.00	ug/L	EPA 6020A	
Chromium - Total		1.26	JB	0.450	1.00	ug/L	EPA 6020A	J
Copper - Total		0.186	J	0.100	1.00	ug/L	EPA 6020A	
Hardness - Total		56		0.018	2.5	mg/L	SM 2340 B	
Lead - Total		0.355	J	0.100	1.00	ug/L	EPA 6020A	
Nickel - Total		0.855	JB	0.100	1.00	ug/L	EPA 6020A	J
Zinc - Total		3.25	JB	0.320	5.00	ug/L	EPA 6020A	J

ANALYTICAL RESULTS

Description: S22E

Lab Sample ID: C109801-01

Received: 08/23/11 11:05

Matrix: Water

Sampled: 08/17/11 10:00

Work Order: C109801

Project: Neuse River

Sampled By: Jamie P. Hughes

Metals (total recoverable) by EPA 6000/7000 Series Methods

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	Batch	Method	Analyzed	By	Notes
Arsenic [7440-38-2] ^	4.70	UD	ug/L	10	4.70	10.0	1H24009	EPA 6020A	09/16/11 13:35	VLO	
Cadmium [7440-43-9] ^	1.00	UD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 13:35	VLO	
Chromium [7440-47-3] ^	6.33	JBD	ug/L	10	4.50	10.0	1H24009	EPA 6020A	09/16/11 13:35	VLO	J
Copper [7440-50-8] ^	9.64	JD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 13:35	VLO	
Lead [7439-92-1] ^	688	D	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 13:35	VLO	
Nickel [7440-02-0] ^	6.18	JBD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 13:35	VLO	QB-01
Selenium [7782-49-2] ^	8.30	UD	ug/L	10	8.30	10.0	1H24009	EPA 6020A	09/16/11 13:35	VLO	
Zinc [7440-66-6] ^	26.3	JBD	ug/L	10	3.20	50.0	1H24009	EPA 6020A	09/16/11 13:35	VLO	QB-01

Description: S22E**Lab Sample ID:** C109801-01**Received:** 08/23/11 11:05**Matrix:** Water**Sampled:** 08/17/11 10:00**Work Order:** C109801**Project:** Neuse River**Sampled By:** Jamie P. Hughes**Classical Chemistry Parameters***^ - ENCO Cary certified analyte [NC 591]*

<u>Analyte</u> <small>[CAS Number]</small>	<u>Results</u>	<u>Flag</u>	<u>Units</u>	<u>DF</u>	<u>MDL</u>	<u>MRL</u>	<u>Batch</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>
Hardness <small>[ECL-0028]</small> ^	54		mg/L	1	0.018	2.5	1H24008	SM 2340 B	08/25/11 10:21	JDH	

Description: S18AE

Lab Sample ID: C109801-02

Received: 08/23/11 11:05

Matrix: Water

Sampled: 08/17/11 10:00

Work Order: C109801

Project: Neuse River

Sampled By: Jamie P. Hughes

Metals (total recoverable) by EPA 6000/7000 Series Methods
[^] - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	Batch	Method	Analyzed	By	Notes
Arsenic [7440-38-2] ^	4.70	UD	ug/L	10	4.70	10.0	1H24009	EPA 6020A	09/16/11 13:40	VLO	
Cadmium [7440-43-9] ^	1.00	UD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 13:40	VLO	
Chromium [7440-47-3] ^	7.37	JBD	ug/L	10	4.50	10.0	1H24009	EPA 6020A	09/16/11 13:40	VLO	J
Copper [7440-50-8] ^	12.9	D	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 13:40	VLO	
Lead [7439-92-1] ^	4770	D	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 13:40	VLO	
Nickel [7440-02-0] ^	11.7	BD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 13:40	VLO	QB-01
Selenium [7782-49-2] ^	8.30	UD	ug/L	10	8.30	10.0	1H24009	EPA 6020A	09/16/11 13:40	VLO	
Zinc [7440-66-6] ^	29.9	JBD	ug/L	10	3.20	50.0	1H24009	EPA 6020A	09/16/11 13:40	VLO	QB-01

Description: S18AE**Lab Sample ID:** C109801-02**Received:** 08/23/11 11:05**Matrix:** Water**Sampled:** 08/17/11 10:00**Work Order:** C109801**Project:** Neuse River**Sampled By:** Jamie P. Hughes**Classical Chemistry Parameters***^ - ENCO Cary certified analyte [NC 591]*

<u>Analyte</u> <small>[CAS Number]</small>	<u>Results</u>	<u>Flag</u>	<u>Units</u>	<u>DF</u>	<u>MDL</u>	<u>MRL</u>	<u>Batch</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>
Hardness <small>[ECL-0028]</small> ^	52		mg/L	1	0.018	2.5	1H24008	SM 2340 B	08/25/11 10:27	JDH	

Description: S13E**Lab Sample ID:** C109801-03**Received:** 08/23/11 11:05**Matrix:** Water**Sampled:** 08/17/11 10:00**Work Order:** C109801**Project:** Neuse River**Sampled By:** Jamie P. Hughes**Metals (total recoverable) by EPA 6000/7000 Series Methods**

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	Batch	Method	Analyzed	By	Notes
Arsenic [7440-38-2] ^	4.70	UD	ug/L	10	4.70	10.0	1H24009	EPA 6020A	09/16/11 13:44	VLO	
Cadmium [7440-43-9] ^	1.00	UD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 13:44	VLO	
Chromium [7440-47-3] ^	4.52	JBD	ug/L	10	4.50	10.0	1H24009	EPA 6020A	09/16/11 13:44	VLO	J
Copper [7440-50-8] ^	6.18	JD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 13:44	VLO	
Lead [7439-92-1] ^	591	D	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 13:44	VLO	
Nickel [7440-02-0] ^	4.39	JBD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 13:44	VLO	QB-01
Selenium [7782-49-2] ^	8.30	UD	ug/L	10	8.30	10.0	1H24009	EPA 6020A	09/16/11 13:44	VLO	
Zinc [7440-66-6] ^	26.8	JBD	ug/L	10	3.20	50.0	1H24009	EPA 6020A	09/16/11 13:44	VLO	QB-01

Description: S13E**Lab Sample ID:** C109801-03**Received:** 08/23/11 11:05**Matrix:** Water**Sampled:** 08/17/11 10:00**Work Order:** C109801**Project:** Neuse River**Sampled By:** Jamie P. Hughes**Classical Chemistry Parameters***^ - ENCO Cary certified analyte [NC 591]*

<u>Analyte</u> <small>[CAS Number]</small>	<u>Results</u>	<u>Flag</u>	<u>Units</u>	<u>DF</u>	<u>MDL</u>	<u>MRL</u>	<u>Batch</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>
Hardness <small>[ECL-0028]</small> ^	61		mg/L	1	0.018	2.5	1H24008	SM 2340 B	08/25/11 10:29	JDH	

Description: S6E**Lab Sample ID:** C109801-04**Received:** 08/23/11 11:05**Matrix:** Water**Sampled:** 08/17/11 13:00**Work Order:** C109801**Project:** Neuse River**Sampled By:** Jamie P. Hughes**Metals (total recoverable) by EPA 6000/7000 Series Methods**

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	Batch	Method	Analyzed	By	Notes
Arsenic [7440-38-2] ^	4.70	UD	ug/L	10	4.70	10.0	1H24009	EPA 6020A	09/16/11 13:48	VLO	
Cadmium [7440-43-9] ^	1.00	UD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 13:48	VLO	
Chromium [7440-47-3] ^	6.99	JBD	ug/L	10	4.50	10.0	1H24009	EPA 6020A	09/16/11 13:48	VLO	J
Copper [7440-50-8] ^	13.8	D	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 13:48	VLO	
Lead [7439-92-1] ^	5050	D	ug/L	20	2.00	20.0	1H24009	EPA 6020A	09/16/11 15:24	VLO	
Nickel [7440-02-0] ^	10.9	BD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 13:48	VLO	QB-01
Selenium [7782-49-2] ^	8.30	UD	ug/L	10	8.30	10.0	1H24009	EPA 6020A	09/16/11 13:48	VLO	
Zinc [7440-66-6] ^	46.2	JBD	ug/L	10	3.20	50.0	1H24009	EPA 6020A	09/16/11 13:48	VLO	QB-01

Description: S6E**Lab Sample ID:** C109801-04**Received:** 08/23/11 11:05**Matrix:** Water**Sampled:** 08/17/11 13:00**Work Order:** C109801**Project:** Neuse River**Sampled By:** Jamie P. Hughes**Classical Chemistry Parameters***^ - ENCO Cary certified analyte [NC 591]*

<u>Analyte</u> [<u>CAS Number</u>]	<u>Results</u>	<u>Flag</u>	<u>Units</u>	<u>DF</u>	<u>MDL</u>	<u>MRL</u>	<u>Batch</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>
Hardness [ECL-0028] ^	60		mg/L	1	0.018	2.5	1H24008	SM 2340 B	08/25/11 10:37	JDH	

Description: S6AE**Lab Sample ID:** C109801-05**Received:** 08/23/11 11:05**Matrix:** Water**Sampled:** 08/17/11 13:00**Work Order:** C109801**Project:** Neuse River**Sampled By:** Jamie P. Hughes**Metals (total recoverable) by EPA 6000/7000 Series Methods**

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	Batch	Method	Analyzed	By	Notes
Arsenic [7440-38-2] ^	0.729	J	ug/L	1	0.470	1.00	1H24009	EPA 6020A	09/16/11 12:54	VLO	
Cadmium [7440-43-9] ^	0.163	J	ug/L	1	0.100	1.00	1H24009	EPA 6020A	09/16/11 12:54	VLO	
Chromium [7440-47-3] ^	5.33	JB	ug/L	1	0.450	1.00	1H24009	EPA 6020A	09/16/11 12:54	VLO	J
Copper [7440-50-8] ^	10.8		ug/L	1	0.100	1.00	1H24009	EPA 6020A	09/16/11 12:54	VLO	
Lead [7439-92-1] ^	1860	D	ug/L	5	0.500	5.00	1H24009	EPA 6020A	09/16/11 13:10	VLO	
Nickel [7440-02-0] ^	4.63	B	ug/L	1	0.100	1.00	1H24009	EPA 6020A	09/16/11 12:54	VLO	QB-01
Selenium [7782-49-2] ^	0.830	U	ug/L	1	0.830	1.00	1H24009	EPA 6020A	09/16/11 12:54	VLO	
Zinc [7440-66-6] ^	17.4	B	ug/L	1	0.320	5.00	1H24009	EPA 6020A	09/16/11 12:54	VLO	QB-01

Description: S6AE**Lab Sample ID:** C109801-05**Received:** 08/23/11 11:05**Matrix:** Water**Sampled:** 08/17/11 13:00**Work Order:** C109801**Project:** Neuse River**Sampled By:** Jamie P. Hughes**Classical Chemistry Parameters***^ - ENCO Cary certified analyte [NC 591]*

<u>Analyte</u> <small>[CAS Number]</small>	<u>Results</u>	<u>Flag</u>	<u>Units</u>	<u>DF</u>	<u>MDL</u>	<u>MRL</u>	<u>Batch</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>
Hardness <small>[ECL-0028]</small> ^	50		mg/L	1	0.018	2.5	1H24008	SM 2340 B	08/25/11 10:39	JDH	

Description: S2E**Lab Sample ID:** C109801-06**Received:** 08/23/11 11:05**Matrix:** Water**Sampled:** 08/17/11 13:00**Work Order:** C109801**Project:** Neuse River**Sampled By:** Jamie P. Hughes**Metals (total recoverable) by EPA 6000/7000 Series Methods**

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	Batch	Method	Analyzed	By	Notes
Arsenic [7440-38-2] ^	4.70	UD	ug/L	10	4.70	10.0	1H24009	EPA 6020A	09/16/11 13:52	VLO	
Cadmium [7440-43-9] ^	1.00	UD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 13:52	VLO	
Chromium [7440-47-3] ^	4.50	UD	ug/L	10	4.50	10.0	1H24009	EPA 6020A	09/16/11 13:52	VLO	
Copper [7440-50-8] ^	7.35	JD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 13:52	VLO	
Lead [7439-92-1] ^	2220	D	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 13:52	VLO	
Nickel [7440-02-0] ^	9.48	JBD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 13:52	VLO	QB-01
Selenium [7782-49-2] ^	8.30	UD	ug/L	10	8.30	10.0	1H24009	EPA 6020A	09/16/11 13:52	VLO	
Zinc [7440-66-6] ^	19.3	JBD	ug/L	10	3.20	50.0	1H24009	EPA 6020A	09/16/11 13:52	VLO	QB-01

Description: S2E**Lab Sample ID:** C109801-06**Received:** 08/23/11 11:05**Matrix:** Water**Sampled:** 08/17/11 13:00**Work Order:** C109801**Project:** Neuse River**Sampled By:** Jamie P. Hughes**Classical Chemistry Parameters***^ - ENCO Cary certified analyte [NC 591]*

<u>Analyte</u> [<u>CAS Number</u>]	<u>Results</u>	<u>Flag</u>	<u>Units</u>	<u>DF</u>	<u>MDL</u>	<u>MRL</u>	<u>Batch</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>
Hardness [ECL-0028] ^	68		mg/L	1	0.018	2.5	1H24008	SM 2340 B	08/25/11 10:41	JDH	

Description: D1E**Lab Sample ID:** C109801-07**Received:** 08/23/11 11:05**Matrix:** Water**Sampled:** 08/17/11 13:30**Work Order:** C109801**Project:** Neuse River**Sampled By:** Jamie P. Hughes**Metals (total recoverable) by EPA 6000/7000 Series Methods**

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	Batch	Method	Analyzed	By	Notes
Arsenic [7440-38-2] ^	4.70	UD	ug/L	10	4.70	10.0	1H24009	EPA 6020A	09/16/11 14:08	VLO	
Cadmium [7440-43-9] ^	1.00	UD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 14:08	VLO	
Chromium [7440-47-3] ^	11.6	BD	ug/L	10	4.50	10.0	1H24009	EPA 6020A	09/16/11 14:08	VLO	QB-01
Copper [7440-50-8] ^	17.5	D	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 14:08	VLO	
Lead [7439-92-1] ^	12200	D	ug/L	100	10.0	100	1H24009	EPA 6020A	09/16/11 15:28	VLO	
Nickel [7440-02-0] ^	29.9	BD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 14:08	VLO	QB-01
Selenium [7782-49-2] ^	8.30	UD	ug/L	10	8.30	10.0	1H24009	EPA 6020A	09/16/11 14:08	VLO	
Zinc [7440-66-6] ^	41.6	JBD	ug/L	10	3.20	50.0	1H24009	EPA 6020A	09/16/11 14:08	VLO	QB-01

Description: D1E**Lab Sample ID:** C109801-07**Received:** 08/23/11 11:05**Matrix:** Water**Sampled:** 08/17/11 13:30**Work Order:** C109801**Project:** Neuse River**Sampled By:** Jamie P. Hughes**Classical Chemistry Parameters**

^ - ENCO Cary certified analyte [NC 591]

<u>Analyte</u> [CAS Number]	<u>Results</u>	<u>Flag</u>	<u>Units</u>	<u>DF</u>	<u>MDL</u>	<u>MRL</u>	<u>Batch</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>
Hardness [ECL-0028] ^	56		mg/L	1	0.018	2.5	1H24008	SM 2340 B	08/25/11 10:43	JDH	

Description: D3E**Lab Sample ID:** C109801-08**Received:** 08/23/11 11:05**Matrix:** Water**Sampled:** 08/17/11 13:00**Work Order:** C109801**Project:** Neuse River**Sampled By:** Jamie P. Hughes**Metals (total recoverable) by EPA 6000/7000 Series Methods**

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	Batch	Method	Analyzed	By	Notes
Arsenic [7440-38-2] ^	4.70	UD	ug/L	10	4.70	10.0	1H24009	EPA 6020A	09/16/11 14:13	VLO	
Cadmium [7440-43-9] ^	1.00	UD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 14:13	VLO	
Chromium [7440-47-3] ^	4.50	UD	ug/L	10	4.50	10.0	1H24009	EPA 6020A	09/16/11 14:13	VLO	
Copper [7440-50-8] ^	6.20	JD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 14:13	VLO	
Lead [7439-92-1] ^	660	D	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 14:13	VLO	
Nickel [7440-02-0] ^	7.33	JBD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 14:13	VLO	QB-01
Selenium [7782-49-2] ^	8.30	UD	ug/L	10	8.30	10.0	1H24009	EPA 6020A	09/16/11 14:13	VLO	
Zinc [7440-66-6] ^	25.1	JBD	ug/L	10	3.20	50.0	1H24009	EPA 6020A	09/16/11 14:13	VLO	QB-01

Description: D3E**Lab Sample ID:** C109801-08**Received:** 08/23/11 11:05**Matrix:** Water**Sampled:** 08/17/11 13:00**Work Order:** C109801**Project:** Neuse River**Sampled By:** Jamie P. Hughes**Classical Chemistry Parameters***^ - ENCO Cary certified analyte [NC 591]*

<u>Analyte</u> [<u>CAS Number</u>]	<u>Results</u>	<u>Flag</u>	<u>Units</u>	<u>DF</u>	<u>MDL</u>	<u>MRL</u>	<u>Batch</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>
Hardness [ECL-0028] ^	71		mg/L	1	0.018	2.5	1H24008	SM 2340 B	08/25/11 10:45	JDH	

Description: D4E**Lab Sample ID:** C109801-09**Received:** 08/23/11 11:05**Matrix:** Water**Sampled:** 08/17/11 14:00**Work Order:** C109801**Project:** Neuse River**Sampled By:** Jamie P. Hughes**Metals (total recoverable) by EPA 6000/7000 Series Methods**

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	Batch	Method	Analyzed	By	Notes
Arsenic [7440-38-2] ^	4.70	UD	ug/L	10	4.70	10.0	1H24009	EPA 6020A	09/16/11 14:17	VLO	
Cadmium [7440-43-9] ^	1.00	UD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 14:17	VLO	
Chromium [7440-47-3] ^	4.53	JBD	ug/L	10	4.50	10.0	1H24009	EPA 6020A	09/16/11 14:17	VLO	J
Copper [7440-50-8] ^	6.60	JD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 14:17	VLO	
Lead [7439-92-1] ^	326	D	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 14:17	VLO	
Nickel [7440-02-0] ^	4.80	JBD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 14:17	VLO	QB-01
Selenium [7782-49-2] ^	8.30	UD	ug/L	10	8.30	10.0	1H24009	EPA 6020A	09/16/11 14:17	VLO	
Zinc [7440-66-6] ^	40.3	JBD	ug/L	10	3.20	50.0	1H24009	EPA 6020A	09/16/11 14:17	VLO	QB-01

Description: D4E**Lab Sample ID:** C109801-09**Received:** 08/23/11 11:05**Matrix:** Water**Sampled:** 08/17/11 14:00**Work Order:** C109801**Project:** Neuse River**Sampled By:** Jamie P. Hughes**Classical Chemistry Parameters***^ - ENCO Cary certified analyte [NC 591]*

<u>Analyte</u> [<u>CAS Number</u>]	<u>Results</u>	<u>Flag</u>	<u>Units</u>	<u>DF</u>	<u>MDL</u>	<u>MRL</u>	<u>Batch</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>
Hardness [ECL-0028] ^	82		mg/L	1	0.018	2.5	1H24008	SM 2340 B	08/25/11 10:47	JDH	

Description: D5E**Lab Sample ID:** C109801-10**Received:** 08/23/11 11:05**Matrix:** Water**Sampled:** 08/17/11 14:00**Work Order:** C109801**Project:** Neuse River**Sampled By:** Jamie P. Hughes**Metals (total recoverable) by EPA 6000/7000 Series Methods**

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	Batch	Method	Analyzed	By	Notes
Arsenic [7440-38-2] ^	4.70	UD	ug/L	10	4.70	10.0	1H24009	EPA 6020A	09/16/11 14:21	VLO	
Cadmium [7440-43-9] ^	1.00	UD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 14:21	VLO	
Chromium [7440-47-3] ^	4.50	UD	ug/L	10	4.50	10.0	1H24009	EPA 6020A	09/16/11 14:21	VLO	
Copper [7440-50-8] ^	8.34	JD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 14:21	VLO	
Lead [7439-92-1] ^	2110	D	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 14:21	VLO	
Nickel [7440-02-0] ^	8.79	JBD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 14:21	VLO	QB-01
Selenium [7782-49-2] ^	8.30	UD	ug/L	10	8.30	10.0	1H24009	EPA 6020A	09/16/11 14:21	VLO	
Zinc [7440-66-6] ^	37.5	JBD	ug/L	10	3.20	50.0	1H24009	EPA 6020A	09/16/11 14:21	VLO	QB-01

Description: D5E**Lab Sample ID:** C109801-10**Received:** 08/23/11 11:05**Matrix:** Water**Sampled:** 08/17/11 14:00**Work Order:** C109801**Project:** Neuse River**Sampled By:** Jamie P. Hughes**Classical Chemistry Parameters***^ - ENCO Cary certified analyte [NC 591]*

<u>Analyte</u> [<u>CAS Number</u>]	<u>Results</u>	<u>Flag</u>	<u>Units</u>	<u>DF</u>	<u>MDL</u>	<u>MRL</u>	<u>Batch</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>
Hardness [ECL-0028] ^	130		mg/L	1	0.018	2.5	1H24008	SM 2340 B	08/25/11 10:49	JDH	

Description: D3E EXTRA

Lab Sample ID: C109801-11

Received: 08/23/11 11:05

Matrix: Water

Sampled: 08/17/11 13:00

Work Order: C109801

Project: Neuse River

Sampled By: Jamie P. Hughes

Metals (total recoverable) by EPA 6000/7000 Series Methods

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	Batch	Method	Analyzed	By	Notes
Arsenic [7440-38-2] ^	4.70	UD	ug/L	10	4.70	10.0	1H24009	EPA 6020A	09/16/11 14:25	VLO	
Cadmium [7440-43-9] ^	1.00	UD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 14:25	VLO	
Chromium [7440-47-3] ^	4.50	UD	ug/L	10	4.50	10.0	1H24009	EPA 6020A	09/16/11 14:25	VLO	
Copper [7440-50-8] ^	1.00	UD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 14:25	VLO	
Lead [7439-92-1] ^	4.91	JD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 14:25	VLO	
Nickel [7440-02-0] ^	3.06	JBD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 14:25	VLO	QB-01
Selenium [7782-49-2] ^	8.30	UD	ug/L	10	8.30	10.0	1H24009	EPA 6020A	09/16/11 14:25	VLO	
Zinc [7440-66-6] ^	11.7	JBD	ug/L	10	3.20	50.0	1H24009	EPA 6020A	09/16/11 14:25	VLO	QB-01

Description: D3E EXTRA**Lab Sample ID:** C109801-11**Received:** 08/23/11 11:05**Matrix:** Water**Sampled:** 08/17/11 13:00**Work Order:** C109801**Project:** Neuse River**Sampled By:** Jamie P. Hughes**Classical Chemistry Parameters***^ - ENCO Cary certified analyte [NC 591]*

<u>Analyte</u> [<u>CAS Number</u>]	<u>Results</u>	<u>Flag</u>	<u>Units</u>	<u>DF</u>	<u>MDL</u>	<u>MRL</u>	<u>Batch</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>
Hardness [ECL-0028] ^	28		mg/L	1	0.018	2.5	1H24008	SM 2340 B	08/25/11 10:51	JDH	

Description: D5E EXTRA**Lab Sample ID:** C109801-12**Received:** 08/23/11 11:05**Matrix:** Water**Sampled:** 08/17/11 14:00**Work Order:** C109801**Project:** Neuse River**Sampled By:** Jamie P. Hughes**Metals (total recoverable) by EPA 6000/7000 Series Methods**

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	Batch	Method	Analyzed	By	Notes
Arsenic [7440-38-2] ^	4.70	UD	ug/L	10	4.70	10.0	1H24009	EPA 6020A	09/16/11 14:29	VLO	
Cadmium [7440-43-9] ^	1.00	UD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 14:29	VLO	
Chromium [7440-47-3] ^	4.50	UD	ug/L	10	4.50	10.0	1H24009	EPA 6020A	09/16/11 14:29	VLO	
Copper [7440-50-8] ^	1.00	UD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 14:29	VLO	
Lead [7439-92-1] ^	5.50	JD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 14:29	VLO	
Nickel [7440-02-0] ^	30.8	BD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 14:29	VLO	QB-01
Selenium [7782-49-2] ^	8.30	UD	ug/L	10	8.30	10.0	1H24009	EPA 6020A	09/16/11 14:29	VLO	
Zinc [7440-66-6] ^	7.29	JBD	ug/L	10	3.20	50.0	1H24009	EPA 6020A	09/16/11 14:29	VLO	QB-01

Description: D5E EXTRA**Lab Sample ID:** C109801-12**Received:** 08/23/11 11:05**Matrix:** Water**Sampled:** 08/17/11 14:00**Work Order:** C109801**Project:** Neuse River**Sampled By:** Jamie P. Hughes**Classical Chemistry Parameters***^ - ENCO Cary certified analyte [NC 591]*

<u>Analyte</u> <small>[CAS Number]</small>	<u>Results</u>	<u>Flag</u>	<u>Units</u>	<u>DF</u>	<u>MDL</u>	<u>MRL</u>	<u>Batch</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>
Hardness <small>[ECL-0028] ^</small>	38		mg/L	1	0.018	2.5	1H24008	SM 2340 B	08/25/11 10:53	JDH	

Description: S22P**Lab Sample ID:** C109801-13**Received:** 08/23/11 11:05**Matrix:** Water**Sampled:** 08/18/11 14:00**Work Order:** C109801**Project:** Neuse River**Sampled By:** Jamie P. Hughes**Metals (total recoverable) by EPA 6000/7000 Series Methods**

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	Batch	Method	Analyzed	By	Notes
Arsenic [7440-38-2] ^	4.70	UD	ug/L	10	4.70	10.0	1H24009	EPA 6020A	09/16/11 14:33	VLO	
Cadmium [7440-43-9] ^	1.00	UD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 14:33	VLO	
Chromium [7440-47-3] ^	4.50	UD	ug/L	10	4.50	10.0	1H24009	EPA 6020A	09/16/11 14:33	VLO	
Copper [7440-50-8] ^	1.19	JD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 14:33	VLO	
Lead [7439-92-1] ^	6.67	JD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 14:33	VLO	
Nickel [7440-02-0] ^	4.52	JBD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 14:33	VLO	QB-01
Selenium [7782-49-2] ^	8.30	UD	ug/L	10	8.30	10.0	1H24009	EPA 6020A	09/16/11 14:33	VLO	
Zinc [7440-66-6] ^	4.14	JBD	ug/L	10	3.20	50.0	1H24009	EPA 6020A	09/16/11 14:33	VLO	J

Description: S22P**Lab Sample ID:** C109801-13**Received:** 08/23/11 11:05**Matrix:** Water**Sampled:** 08/18/11 14:00**Work Order:** C109801**Project:** Neuse River**Sampled By:** Jamie P. Hughes**Classical Chemistry Parameters***^ - ENCO Cary certified analyte [NC 591]*

<u>Analyte</u> [<u>CAS Number</u>]	<u>Results</u>	<u>Flag</u>	<u>Units</u>	<u>DF</u>	<u>MDL</u>	<u>MRL</u>	<u>Batch</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>
Hardness [ECL-0028] ^	12		mg/L	1	0.018	2.5	1H24008	SM 2340 B	08/25/11 10:56	JDH	

Description: S18AP**Lab Sample ID:** C109801-14**Received:** 08/23/11 11:05**Matrix:** Water**Sampled:** 08/18/11 14:00**Work Order:** C109801**Project:** Neuse River**Sampled By:** Jamie P. Hughes**Metals (total recoverable) by EPA 6000/7000 Series Methods**

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	Batch	Method	Analyzed	By	Notes
Arsenic [7440-38-2] ^	4.70	UD	ug/L	10	4.70	10.0	1H24009	EPA 6020A	09/16/11 14:37	VLO	
Cadmium [7440-43-9] ^	1.00	UD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 14:37	VLO	
Chromium [7440-47-3] ^	4.50	UD	ug/L	10	4.50	10.0	1H24009	EPA 6020A	09/16/11 14:37	VLO	
Copper [7440-50-8] ^	1.10	JD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 14:37	VLO	
Lead [7439-92-1] ^	7.00	JD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 14:37	VLO	
Nickel [7440-02-0] ^	1.00	UD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 14:37	VLO	
Selenium [7782-49-2] ^	8.30	UD	ug/L	10	8.30	10.0	1H24009	EPA 6020A	09/16/11 14:37	VLO	
Zinc [7440-66-6] ^	20.8	JBD	ug/L	10	3.20	50.0	1H24009	EPA 6020A	09/16/11 14:37	VLO	QB-01

Description: S18AP**Lab Sample ID:** C109801-14**Received:** 08/23/11 11:05**Matrix:** Water**Sampled:** 08/18/11 14:00**Work Order:** C109801**Project:** Neuse River**Sampled By:** Jamie P. Hughes**Classical Chemistry Parameters***^ - ENCO Cary certified analyte [NC 591]*

<u>Analyte</u> [<u>CAS Number</u>]	<u>Results</u>	<u>Flag</u>	<u>Units</u>	<u>DF</u>	<u>MDL</u>	<u>MRL</u>	<u>Batch</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>
Hardness [ECL-0028] ^	21		mg/L	1	0.018	2.5	1H24008	SM 2340 B	08/25/11 11:03	JDH	

Description: S13P**Lab Sample ID:** C109801-15**Received:** 08/23/11 11:05**Matrix:** Water**Sampled:** 08/18/11 14:00**Work Order:** C109801**Project:** Neuse River**Sampled By:** Jamie P. Hughes**Metals (total recoverable) by EPA 6000/7000 Series Methods**

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	Batch	Method	Analyzed	By	Notes
Arsenic [7440-38-2] ^	4.70	UD	ug/L	10	4.70	10.0	1H24009	EPA 6020A	09/16/11 14:41	VLO	
Cadmium [7440-43-9] ^	1.00	UD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 14:41	VLO	
Chromium [7440-47-3] ^	4.50	UD	ug/L	10	4.50	10.0	1H24009	EPA 6020A	09/16/11 14:41	VLO	
Copper [7440-50-8] ^	1.07	JD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 14:41	VLO	
Lead [7439-92-1] ^	6.01	JD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 14:41	VLO	
Nickel [7440-02-0] ^	2.36	JBD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 14:41	VLO	QB-01
Selenium [7782-49-2] ^	8.30	UD	ug/L	10	8.30	10.0	1H24009	EPA 6020A	09/16/11 14:41	VLO	
Zinc [7440-66-6] ^	9.76	JBD	ug/L	10	3.20	50.0	1H24009	EPA 6020A	09/16/11 14:41	VLO	QB-01

Description: S13P**Lab Sample ID:** C109801-15**Received:** 08/23/11 11:05**Matrix:** Water**Sampled:** 08/18/11 14:00**Work Order:** C109801**Project:** Neuse River**Sampled By:** Jamie P. Hughes**Classical Chemistry Parameters***^ - ENCO Cary certified analyte [NC 591]*

<u>Analyte</u> [<u>CAS Number</u>]	<u>Results</u>	<u>Flag</u>	<u>Units</u>	<u>DF</u>	<u>MDL</u>	<u>MRL</u>	<u>Batch</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>
Hardness [ECL-0028] ^	33		mg/L	1	0.018	2.5	1H24008	SM 2340 B	08/25/11 11:05	JDH	

Description: S6P**Lab Sample ID:** C109801-16**Received:** 08/23/11 11:05**Matrix:** Water**Sampled:** 08/18/11 14:00**Work Order:** C109801**Project:** Neuse River**Sampled By:** Jamie P. Hughes**Metals (total recoverable) by EPA 6000/7000 Series Methods**

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	Batch	Method	Analyzed	By	Notes
Arsenic [7440-38-2] ^	4.70	UD	ug/L	10	4.70	10.0	1H24009	EPA 6020A	09/16/11 14:46	VLO	
Cadmium [7440-43-9] ^	1.00	UD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 14:46	VLO	
Chromium [7440-47-3] ^	4.50	UD	ug/L	10	4.50	10.0	1H24009	EPA 6020A	09/16/11 14:46	VLO	
Copper [7440-50-8] ^	2.27	JD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 14:46	VLO	
Lead [7439-92-1] ^	7.13	JD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 14:46	VLO	
Nickel [7440-02-0] ^	1.91	JBD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 14:46	VLO	QB-01
Selenium [7782-49-2] ^	8.30	UD	ug/L	10	8.30	10.0	1H24009	EPA 6020A	09/16/11 14:46	VLO	
Zinc [7440-66-6] ^	4.09	JBD	ug/L	10	3.20	50.0	1H24009	EPA 6020A	09/16/11 14:46	VLO	J

Description: S6P**Lab Sample ID:** C109801-16**Received:** 08/23/11 11:05**Matrix:** Water**Sampled:** 08/18/11 14:00**Work Order:** C109801**Project:** Neuse River**Sampled By:** Jamie P. Hughes**Classical Chemistry Parameters***^ - ENCO Cary certified analyte [NC 591]*

<u>Analyte</u> <small>[CAS Number]</small>	<u>Results</u>	<u>Flag</u>	<u>Units</u>	<u>DF</u>	<u>MDL</u>	<u>MRL</u>	<u>Batch</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>
Hardness <small>[ECL-0028] ^</small>	34		mg/L	1	0.018	2.5	1H24008	SM 2340 B	08/25/11 11:07	JDH	

Description: S6AP**Lab Sample ID:** C109801-17**Received:** 08/23/11 11:05**Matrix:** Water**Sampled:** 08/18/11 14:00**Work Order:** C109801**Project:** Neuse River**Sampled By:** Jamie P. Hughes**Metals (total recoverable) by EPA 6000/7000 Series Methods**

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	Batch	Method	Analyzed	By	Notes
Arsenic [7440-38-2] ^	4.70	UD	ug/L	10	4.70	10.0	1H24009	EPA 6020A	09/16/11 15:03	VLO	
Cadmium [7440-43-9] ^	1.00	UD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 15:03	VLO	
Chromium [7440-47-3] ^	4.50	UD	ug/L	10	4.50	10.0	1H24009	EPA 6020A	09/16/11 15:03	VLO	
Copper [7440-50-8] ^	4.00	JD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 15:03	VLO	
Lead [7439-92-1] ^	8.42	JD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 15:03	VLO	
Nickel [7440-02-0] ^	2.11	JBD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 15:03	VLO	QB-01
Selenium [7782-49-2] ^	8.30	UD	ug/L	10	8.30	10.0	1H24009	EPA 6020A	09/16/11 15:03	VLO	
Zinc [7440-66-6] ^	17.8	JBD	ug/L	10	3.20	50.0	1H24009	EPA 6020A	09/16/11 15:03	VLO	QB-01

Description: S6AP**Lab Sample ID:** C109801-17**Received:** 08/23/11 11:05**Matrix:** Water**Sampled:** 08/18/11 14:00**Work Order:** C109801**Project:** Neuse River**Sampled By:** Jamie P. Hughes**Classical Chemistry Parameters***^ - ENCO Cary certified analyte [NC 591]*

<u>Analyte</u> [<u>CAS Number</u>]	<u>Results</u>	<u>Flag</u>	<u>Units</u>	<u>DF</u>	<u>MDL</u>	<u>MRL</u>	<u>Batch</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>
Hardness [ECL-0028] ^	23		mg/L	1	0.018	2.5	1H24008	SM 2340 B	08/25/11 11:09	JDH	

Description: S2P**Lab Sample ID:** C109801-18**Received:** 08/23/11 11:05**Matrix:** Water**Sampled:** 08/18/11 14:00**Work Order:** C109801**Project:** Neuse River**Sampled By:** Jamie P. Hughes**Metals (total recoverable) by EPA 6000/7000 Series Methods**

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	Batch	Method	Analyzed	By	Notes
Arsenic [7440-38-2] ^	4.70	UD	ug/L	10	4.70	10.0	1H24009	EPA 6020A	09/16/11 15:07	VLO	
Cadmium [7440-43-9] ^	1.00	UD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 15:07	VLO	
Chromium [7440-47-3] ^	4.50	UD	ug/L	10	4.50	10.0	1H24009	EPA 6020A	09/16/11 15:07	VLO	
Copper [7440-50-8] ^	2.66	JD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 15:07	VLO	
Lead [7439-92-1] ^	7.20	JD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 15:07	VLO	
Nickel [7440-02-0] ^	2.22	JBD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 15:07	VLO	QB-01
Selenium [7782-49-2] ^	8.30	UD	ug/L	10	8.30	10.0	1H24009	EPA 6020A	09/16/11 15:07	VLO	
Zinc [7440-66-6] ^	19.1	JBD	ug/L	10	3.20	50.0	1H24009	EPA 6020A	09/16/11 15:07	VLO	QB-01

Description: S2P**Lab Sample ID:** C109801-18**Received:** 08/23/11 11:05**Matrix:** Water**Sampled:** 08/18/11 14:00**Work Order:** C109801**Project:** Neuse River**Sampled By:** Jamie P. Hughes**Classical Chemistry Parameters***^ - ENCO Cary certified analyte [NC 591]*

<u>Analyte</u> [<u>CAS Number</u>]	<u>Results</u>	<u>Flag</u>	<u>Units</u>	<u>DF</u>	<u>MDL</u>	<u>MRL</u>	<u>Batch</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>
Hardness [ECL-0028] ^	38		mg/L	1	0.018	2.5	1H24008	SM 2340 B	08/25/11 11:11	JDH	

Description: D1P**Lab Sample ID:** C109801-19**Received:** 08/23/11 11:05**Matrix:** Water**Sampled:** 08/18/11 14:00**Work Order:** C109801**Project:** Neuse River**Sampled By:** Jamie P. Hughes**Metals (total recoverable) by EPA 6000/7000 Series Methods**

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	Batch	Method	Analyzed	By	Notes
Arsenic [7440-38-2] ^	4.70	UD	ug/L	10	4.70	10.0	1H24009	EPA 6020A	09/16/11 15:11	VLO	
Cadmium [7440-43-9] ^	1.00	UD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 15:11	VLO	
Chromium [7440-47-3] ^	4.50	UD	ug/L	10	4.50	10.0	1H24009	EPA 6020A	09/16/11 15:11	VLO	
Copper [7440-50-8] ^	1.00	UD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 15:11	VLO	
Lead [7439-92-1] ^	5.73	JD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 15:11	VLO	
Nickel [7440-02-0] ^	3.20	JBD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 15:11	VLO	QB-01
Selenium [7782-49-2] ^	8.30	UD	ug/L	10	8.30	10.0	1H24009	EPA 6020A	09/16/11 15:11	VLO	
Zinc [7440-66-6] ^	3.20	UD	ug/L	10	3.20	50.0	1H24009	EPA 6020A	09/16/11 15:11	VLO	QB-01

Description: D1P**Lab Sample ID:** C109801-19**Received:** 08/23/11 11:05**Matrix:** Water**Sampled:** 08/18/11 14:00**Work Order:** C109801**Project:** Neuse River**Sampled By:** Jamie P. Hughes**Classical Chemistry Parameters***^ - ENCO Cary certified analyte [NC 591]*

<u>Analyte</u> [<u>CAS Number</u>]	<u>Results</u>	<u>Flag</u>	<u>Units</u>	<u>DF</u>	<u>MDL</u>	<u>MRL</u>	<u>Batch</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>
Hardness [ECL-0028] ^	19		mg/L	1	0.018	2.5	1H24008	SM 2340 B	08/25/11 11:13	JDH	

Description: D3P**Lab Sample ID:** C109801-20**Received:** 08/23/11 11:05**Matrix:** Water**Sampled:** 08/18/11 14:00**Work Order:** C109801**Project:** Neuse River**Sampled By:** Jamie P. Hughes**Metals (total recoverable) by EPA 6000/7000 Series Methods**

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	Batch	Method	Analyzed	By	Notes
Arsenic [7440-38-2] ^	4.70	UD	ug/L	10	4.70	10.0	1H24009	EPA 6020A	09/16/11 15:15	VLO	
Cadmium [7440-43-9] ^	1.00	UD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 15:15	VLO	
Chromium [7440-47-3] ^	4.50	UD	ug/L	10	4.50	10.0	1H24009	EPA 6020A	09/16/11 15:15	VLO	
Copper [7440-50-8] ^	4.29	JD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 15:15	VLO	
Lead [7439-92-1] ^	6.63	JD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 15:15	VLO	
Nickel [7440-02-0] ^	3.68	JBD	ug/L	10	1.00	10.0	1H24009	EPA 6020A	09/16/11 15:15	VLO	QB-01
Selenium [7782-49-2] ^	8.30	UD	ug/L	10	8.30	10.0	1H24009	EPA 6020A	09/16/11 15:15	VLO	
Zinc [7440-66-6] ^	25.6	JBD	ug/L	10	3.20	50.0	1H24009	EPA 6020A	09/16/11 15:15	VLO	QB-01

Description: D3P**Lab Sample ID:** C109801-20**Received:** 08/23/11 11:05**Matrix:** Water**Sampled:** 08/18/11 14:00**Work Order:** C109801**Project:** Neuse River**Sampled By:** Jamie P. Hughes**Classical Chemistry Parameters***^ - ENCO Cary certified analyte [NC 591]*

<u>Analyte</u> [<u>CAS Number</u>]	<u>Results</u>	<u>Flag</u>	<u>Units</u>	<u>DF</u>	<u>MDL</u>	<u>MRL</u>	<u>Batch</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>
Hardness [ECL-0028] ^	29		mg/L	1	0.018	2.5	1H24008	SM 2340 B	08/25/11 11:15	JDH	

Description: D4P**Lab Sample ID:** C109801-21**Received:** 08/23/11 11:05**Matrix:** Water**Sampled:** 08/18/11 14:00**Work Order:** C109801**Project:** Neuse River**Sampled By:** Jamie P. Hughes**Metals (total recoverable) by EPA 6000/7000 Series Methods**

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	Batch	Method	Analyzed	By	Notes
Arsenic [7440-38-2] ^	1.40		ug/L	1	0.470	1.00	1H25018	EPA 6020A	09/15/11 13:21	VLO	
Cadmium [7440-43-9] ^	0.100	U	ug/L	1	0.100	1.00	1H25018	EPA 6020A	09/15/11 13:21	VLO	
Chromium [7440-47-3] ^	1.43	JB	ug/L	1	0.450	1.00	1H25018	EPA 6020A	09/15/11 13:21	VLO	J
Copper [7440-50-8] ^	0.557	J	ug/L	1	0.100	1.00	1H25018	EPA 6020A	09/15/11 13:21	VLO	
Lead [7439-92-1] ^	0.638	J	ug/L	1	0.100	1.00	1H25018	EPA 6020A	09/15/11 13:21	VLO	
Nickel [7440-02-0] ^	0.923	JB	ug/L	1	0.100	1.00	1H25018	EPA 6020A	09/15/11 13:21	VLO	J
Selenium [7782-49-2] ^	0.830	U	ug/L	1	0.830	1.00	1H25018	EPA 6020A	09/15/11 13:21	VLO	
Zinc [7440-66-6] ^	2.59	JB	ug/L	1	0.320	5.00	1H25018	EPA 6020A	09/15/11 13:21	VLO	J

Description: D4P**Lab Sample ID:** C109801-21**Received:** 08/23/11 11:05**Matrix:** Water**Sampled:** 08/18/11 14:00**Work Order:** C109801**Project:** Neuse River**Sampled By:** Jamie P. Hughes**Classical Chemistry Parameters***^ - ENCO Cary certified analyte [NC 591]*

<u>Analyte</u> [CAS Number]	<u>Results</u>	<u>Flag</u>	<u>Units</u>	<u>DF</u>	<u>MDL</u>	<u>MRL</u>	<u>Batch</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>
Hardness [ECL-0028] ^	40		mg/L	1	0.018	2.5	1H25015	SM 2340 B	08/26/11 11:29	JDH	

Description: D5P**Lab Sample ID:** C109801-22**Received:** 08/23/11 11:05**Matrix:** Water**Sampled:** 08/18/11 14:00**Work Order:** C109801**Project:** Neuse River**Sampled By:** Jamie P. Hughes**Metals (total recoverable) by EPA 6000/7000 Series Methods**

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	Batch	Method	Analyzed	By	Notes
Arsenic [7440-38-2] ^	2.41		ug/L	1	0.470	1.00	1H25018	EPA 6020A	09/15/11 13:46	VLO	
Cadmium [7440-43-9] ^	0.123	J	ug/L	1	0.100	1.00	1H25018	EPA 6020A	09/15/11 13:46	VLO	
Chromium [7440-47-3] ^	1.46	JB	ug/L	1	0.450	1.00	1H25018	EPA 6020A	09/15/11 13:46	VLO	J
Copper [7440-50-8] ^	0.936	J	ug/L	1	0.100	1.00	1H25018	EPA 6020A	09/15/11 13:46	VLO	
Lead [7439-92-1] ^	1.12		ug/L	1	0.100	1.00	1H25018	EPA 6020A	09/15/11 13:46	VLO	
Nickel [7440-02-0] ^	1.07	JB	ug/L	1	0.100	1.00	1H25018	EPA 6020A	09/15/11 13:46	VLO	J
Selenium [7782-49-2] ^	0.830	U	ug/L	1	0.830	1.00	1H25018	EPA 6020A	09/15/11 13:46	VLO	
Zinc [7440-66-6] ^	2.08	JB	ug/L	1	0.320	5.00	1H25018	EPA 6020A	09/15/11 13:46	VLO	J

Description: D5P**Lab Sample ID:** C109801-22**Received:** 08/23/11 11:05**Matrix:** Water**Sampled:** 08/18/11 14:00**Work Order:** C109801**Project:** Neuse River**Sampled By:** Jamie P. Hughes**Classical Chemistry Parameters***^ - ENCO Cary certified analyte [NC 591]*

<u>Analyte</u> [<u>CAS Number</u>]	<u>Results</u>	<u>Flag</u>	<u>Units</u>	<u>DF</u>	<u>MDL</u>	<u>MRL</u>	<u>Batch</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>
Hardness [ECL-0028] ^	76		mg/L	1	0.018	2.5	1H25015	SM 2340 B	08/26/11 11:31	JDH	

Description: D5PW EXTRA**Lab Sample ID:** C109801-23**Received:** 08/23/11 11:05**Matrix:** Water**Sampled:** 08/18/11 14:00**Work Order:** C109801**Project:** Neuse River**Sampled By:** Jamie P. Hughes**Metals (total recoverable) by EPA 6000/7000 Series Methods**

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	Batch	Method	Analyzed	By	Notes
Arsenic [7440-38-2] ^	3.27		ug/L	1	0.470	1.00	1H25018	EPA 6020A	09/15/11 13:50	VLO	
Cadmium [7440-43-9] ^	0.186	J	ug/L	1	0.100	1.00	1H25018	EPA 6020A	09/15/11 13:50	VLO	
Chromium [7440-47-3] ^	1.42	JB	ug/L	1	0.450	1.00	1H25018	EPA 6020A	09/15/11 13:50	VLO	J
Copper [7440-50-8] ^	0.160	J	ug/L	1	0.100	1.00	1H25018	EPA 6020A	09/15/11 13:50	VLO	
Lead [7439-92-1] ^	0.153	J	ug/L	1	0.100	1.00	1H25018	EPA 6020A	09/15/11 13:50	VLO	
Nickel [7440-02-0] ^	1.70	JB	ug/L	1	0.100	1.00	1H25018	EPA 6020A	09/15/11 13:50	VLO	J
Selenium [7782-49-2] ^	1.09		ug/L	1	0.830	1.00	1H25018	EPA 6020A	09/15/11 13:50	VLO	
Zinc [7440-66-6] ^	6.38	JB	ug/L	1	0.320	5.00	1H25018	EPA 6020A	09/15/11 13:50	VLO	J

Description: D5PW EXTRA**Lab Sample ID:** C109801-23**Received:** 08/23/11 11:05**Matrix:** Water**Sampled:** 08/18/11 14:00**Work Order:** C109801**Project:** Neuse River**Sampled By:** Jamie P. Hughes**Classical Chemistry Parameters***^ - ENCO Cary certified analyte [NC 591]*

<u>Analyte</u> <small>[CAS Number]</small>	<u>Results</u>	<u>Flag</u>	<u>Units</u>	<u>DF</u>	<u>MDL</u>	<u>MRL</u>	<u>Batch</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>
Hardness <small>[ECL-0028]</small> ^	150		mg/L	1	0.018	2.5	1H25015	SM 2340 B	08/26/11 11:33	JDH	

Description: D3PW EXTRA**Lab Sample ID:** C109801-24**Received:** 08/23/11 11:05**Matrix:** Water**Sampled:** 08/18/11 14:00**Work Order:** C109801**Project:** Neuse River**Sampled By:** Jamie P. Hughes**Metals (total recoverable) by EPA 6000/7000 Series Methods**

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	Batch	Method	Analyzed	By	Notes
Arsenic [7440-38-2] ^	0.931	J	ug/L	1	0.470	1.00	1H25018	EPA 6020A	09/15/11 14:06	VLO	
Cadmium [7440-43-9] ^	0.106	J	ug/L	1	0.100	1.00	1H25018	EPA 6020A	09/15/11 14:06	VLO	
Chromium [7440-47-3] ^	1.26	JB	ug/L	1	0.450	1.00	1H25018	EPA 6020A	09/15/11 14:06	VLO	J
Copper [7440-50-8] ^	0.186	J	ug/L	1	0.100	1.00	1H25018	EPA 6020A	09/15/11 14:06	VLO	
Lead [7439-92-1] ^	0.355	J	ug/L	1	0.100	1.00	1H25018	EPA 6020A	09/15/11 14:06	VLO	
Nickel [7440-02-0] ^	0.855	JB	ug/L	1	0.100	1.00	1H25018	EPA 6020A	09/15/11 14:06	VLO	J
Selenium [7782-49-2] ^	0.830	U	ug/L	1	0.830	1.00	1H25018	EPA 6020A	09/15/11 14:06	VLO	
Zinc [7440-66-6] ^	3.25	JB	ug/L	1	0.320	5.00	1H25018	EPA 6020A	09/15/11 14:06	VLO	J

Description: D3PW EXTRA**Lab Sample ID:** C109801-24**Received:** 08/23/11 11:05**Matrix:** Water**Sampled:** 08/18/11 14:00**Work Order:** C109801**Project:** Neuse River**Sampled By:** Jamie P. Hughes**Classical Chemistry Parameters***^ - ENCO Cary certified analyte [NC 591]*

<u>Analyte</u> <small>[CAS Number]</small>	<u>Results</u>	<u>Flag</u>	<u>Units</u>	<u>DF</u>	<u>MDL</u>	<u>MRL</u>	<u>Batch</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>
Hardness <small>[ECL-0028] ^</small>	56		mg/L	1	0.018	2.5	1H25015	SM 2340 B	08/26/11 11:35	JDH	

QUALITY CONTROL**Metals (total recoverable) by EPA 6000/7000 Series Methods - Quality Control**

Batch 1H24009 - EPA 3005A

Blank (1H24009-BLK1)

Prepared: 08/24/2011 09:10 Analyzed: 09/16/2011 12:37

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Arsenic	0.470	U	1.00	ug/L							
Cadmium	0.100	U	1.00	ug/L							
Chromium	0.750	J	1.00	ug/L							
Copper	0.100	U	1.00	ug/L							
Lead	0.100	U	1.00	ug/L							
Nickel	0.109	J	1.00	ug/L							
Selenium	0.830	U	1.00	ug/L							
Zinc	0.466	J	5.00	ug/L							

LCS (1H24009-BS1)

Prepared: 08/24/2011 09:10 Analyzed: 09/16/2011 12:41

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Arsenic	208		1.00	ug/L	200		104	80-120			
Cadmium	223		1.00	ug/L	200		111	80-120			
Chromium	194	B	1.00	ug/L	200		97	80-120			
Copper	215		1.00	ug/L	200		107	80-120			
Lead	214		1.00	ug/L	200		107	80-120			
Nickel	209	B	1.00	ug/L	200		105	80-120			
Selenium	206		1.00	ug/L	200		103	80-120			
Zinc	218	B	5.00	ug/L	200		109	80-120			

Matrix Spike (1H24009-MS1)

Prepared: 08/24/2011 09:10 Analyzed: 09/16/2011 12:58

Source: C109801-05

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Arsenic	197		1.00	ug/L	200	0.729	98	75-125			
Cadmium	224		1.00	ug/L	200	0.163	112	75-125			
Chromium	197	B	1.00	ug/L	200	5.33	96	75-125			
Copper	224		1.00	ug/L	200	10.8	107	75-125			
Lead	1970		1.00	ug/L	200	1700	138	75-125			QM-07
Nickel	212	B	1.00	ug/L	200	4.63	104	80-120			
Selenium	187		1.00	ug/L	200	0.830 U	93	75-125			
Zinc	238	B	5.00	ug/L	200	17.4	110	75-125			

Matrix Spike Dup (1H24009-MSD1)

Prepared: 08/24/2011 09:10 Analyzed: 09/16/2011 13:02

Source: C109801-05

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Arsenic	200		1.00	ug/L	200	0.729	100	75-125	2	20	
Cadmium	225		1.00	ug/L	200	0.163	112	75-125	0.6	20	
Chromium	191	B	1.00	ug/L	200	5.33	93	75-125	3	20	
Copper	216		1.00	ug/L	200	10.8	103	75-125	3	20	
Lead	2080		1.00	ug/L	200	1700	192	75-125	5	20	QM-07
Nickel	207	B	1.00	ug/L	200	4.63	101	80-120	2	20	
Selenium	185		1.00	ug/L	200	0.830 U	92	75-125	1	20	
Zinc	234	B	5.00	ug/L	200	17.4	109	75-125	2	20	

QUALITY CONTROL

Metals (total recoverable) by EPA 6000/7000 Series Methods - Quality Control

Batch 1H24009 - EPA 3005A

Post Spike (1H24009-PS1)

Prepared: 08/24/2011 09:10 Analyzed: 09/16/2011 13:06

Source: C109801-05

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Arsenic	216		1.00	ug/L	200	0.729	107	80-120			
Cadmium	224		1.00	ug/L	200	0.163	112	80-120			
Chromium	193	B	1.00	ug/L	200	5.33	94	80-120			
Copper	218		1.00	ug/L	200	10.8	104	80-120			
Lead	1960		1.00	ug/L	200	1700	134	80-120			QM-08
Nickel	205	B	1.00	ug/L	200	4.63	100	80-120			
Selenium	205		1.00	ug/L	200	-0.232	103	80-120			
Zinc	235	B	5.00	ug/L	200	17.4	109	80-120			

Batch 1H25018 - EPA 3005A

Blank (1H25018-BLK1)

Prepared: 08/25/2011 10:02 Analyzed: 09/15/2011 13:13

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Arsenic	0.470	U	1.00	ug/L							
Cadmium	0.100	U	1.00	ug/L							
Chromium	0.882	J	1.00	ug/L							
Copper	0.100	U	1.00	ug/L							
Lead	0.100	U	1.00	ug/L							
Nickel	0.156	J	1.00	ug/L							
Selenium	0.830	U	1.00	ug/L							
Zinc	0.506	J	5.00	ug/L							

LCS (1H25018-BS1)

Prepared: 08/25/2011 10:02 Analyzed: 09/15/2011 13:17

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Arsenic	209		1.00	ug/L	200		104	80-120			
Cadmium	215		1.00	ug/L	200		107	80-120			
Chromium	200	B	1.00	ug/L	200		100	80-120			
Copper	208		1.00	ug/L	200		104	80-120			
Lead	216		1.00	ug/L	200		108	80-120			
Nickel	210	B	1.00	ug/L	200		105	80-120			
Selenium	215		1.00	ug/L	200		108	80-120			
Zinc	209	B	5.00	ug/L	200		105	80-120			

Matrix Spike (1H25018-MS1)

Prepared: 08/25/2011 10:02 Analyzed: 09/15/2011 13:25

Source: C109801-21

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Arsenic	207		1.00	ug/L	200	1.40	103	75-125			
Cadmium	212		1.00	ug/L	200	0.100 U	106	75-125			
Chromium	195	B	1.00	ug/L	200	1.43	97	75-125			
Copper	197		1.00	ug/L	200	0.557	98	75-125			
Lead	212		1.00	ug/L	200	0.638	106	75-125			
Nickel	201	B	1.00	ug/L	200	0.923	100	80-120			
Selenium	211		1.00	ug/L	200	0.830 U	106	75-125			
Zinc	207	B	5.00	ug/L	200	2.59	102	75-125			

QUALITY CONTROL

Metals (total recoverable) by EPA 6000/7000 Series Methods - Quality Control

Batch 1H25018 - EPA 3005A

Matrix Spike Dup (1H25018-MSD1)

Prepared: 08/25/2011 10:02 Analyzed: 09/15/2011 13:30

Source: C109801-21

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Arsenic	205		1.00	ug/L	200	1.40	102	75-125	1	20	
Cadmium	211		1.00	ug/L	200	0.100 U	105	75-125	0.4	20	
Chromium	194	B	1.00	ug/L	200	1.43	96	75-125	0.2	20	
Copper	192		1.00	ug/L	200	0.557	96	75-125	3	20	
Lead	215		1.00	ug/L	200	0.638	107	75-125	1	20	
Nickel	197	B	1.00	ug/L	200	0.923	98	80-120	2	20	
Selenium	212		1.00	ug/L	200	0.830 U	106	75-125	0.1	20	
Zinc	203	B	5.00	ug/L	200	2.59	100	75-125	2	20	

Post Spike (1H25018-PS1)

Prepared: 08/25/2011 10:02 Analyzed: 09/15/2011 13:34

Source: C109801-21

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Arsenic	200		1.00	ug/L	200	1.40	99	80-120			
Cadmium	206		1.00	ug/L	200	0.0430	103	80-120			
Chromium	189	B	1.00	ug/L	200	1.43	94	80-120			
Copper	189		1.00	ug/L	200	0.557	94	80-120			
Lead	208		1.00	ug/L	200	0.638	104	80-120			
Nickel	192	B	1.00	ug/L	200	0.923	96	80-120			
Selenium	204		1.00	ug/L	200	0.487	102	80-120			
Zinc	200	B	5.00	ug/L	200	2.59	99	80-120			

Classical Chemistry Parameters - Quality Control

Batch 1H24008 - EPA 3005A

Blank (1H24008-BLK1)

Prepared: 08/24/2011 09:07 Analyzed: 08/25/2011 10:18

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Hardness	0.018	U	2.5	mg/L							

Batch 1H25015 - EPA 3005A

Blank (1H25015-BLK1)

Prepared: 08/25/2011 09:54 Analyzed: 08/26/2011 10:51

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Hardness	0.018	U	2.5	mg/L							

FLAGS/NOTES AND DEFINITIONS

- B The analyte was detected in the associated method blank.
- D The sample was analyzed at dilution.
- J The reported value is between the laboratory method detection limit (MDL) and the laboratory method reporting limit (MRL), adjusted for actual sample preparation data and moisture content, where applicable.
- U The analyte was analyzed for but not detected to the level shown, adjusted for actual sample preparation data and moisture content, where applicable.
- E The concentration indicated for this analyte is an estimated value above the calibration range of the instrument. This value is considered an estimate.
- MRL Method Reporting Limit. The MRL is roughly equivalent to the practical quantitation limit (PQL) and is based on the low point of the calibration curve, when applicable, sample preparation factor, dilution factor, and, in the case of soil samples, moisture content.
- QB-01 The method blank had a positive result for the analyte; however, the concentration in the method blank is less than 10% of the sample result, which minimizes the impact of the deviation.
- QM-07 The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
- QM-08 Post-digestion spike did not meet method requirements due to confirmed matrix effects (dilution test).



ENVIRONMENTAL CONSERVATION LABORATORIES CHAIN-OF-CUSTODY RECORD

10775 Central Park Dr.

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4810 Executive Park Court, Suite 211

Jacksonville, FL 32216-6069

(904) 296-3007 Fax (904) 296-3210

102-A Woodwinds Industrial Ct.

Cary, NC 27511

(919) 467-3930 Fax (919) 467-3815

www.encolabs.com

Client Name RiverBank Ecosystems (RBI01)		Project Number Neuse River		Requested Analyses												Requested Turnaround Times		
Address PO Box 29121	Project Name/Desc. Neuse River	PO # / Billing Info	Reporting Contact Adam Riggsbee													Note - Rush requests subject to acceptance by the facility		
City/ST/Zip Austin, TX 78755	Tel (512) 241-3775	Fax	Billing Contact Adam Riggsbee													<input type="checkbox"/> Standard		
Sampler(s) Name, Affiliation (Print) James D. Hughes CERC				Site Location / Time Zone												<input type="checkbox"/> Expedited		
Sampler(s) Signature <i>James D. Hughes</i>																Due <u>/</u> / <u>/</u>		
																Lab Workorder C109801		
Preservation (See Codes) (Complete as necessary)																		
Item #	Sample ID (Field Identification)	Collection Date 8/17/11	Collection Time 10:00 AM	Comp / Grab	Matrix (see codes)	Total # of Containers	Sample Comments											
✓	S22E	8/17/11	10:00 AM	WA	1	X												
✓	S18AE	8/17/11	10:00 AM	WA	1	X												
✓	S13E	8/17/11	10:00 AM	WA	1	X												
✓	S6E	8/17/11	1:00 PM	WA	1	X												
✓	S6AE	8/17/11	1:00 PM	WA	1	X												
✓	S2E	8/17/11	1:00 PM	WA	1	X												
✓	D1E	8/17/11	1:30 PM	WA	1	X												
✓	D3E	8/17/11	1:30 PM	WA	1	X												
✓	D4E	8/17/11	2:00 PM	WA	1	X												
✓	D5E	8/17/11	2:00 PM	WA	1	X												
✓	D3E E11-1	8/17/11	2:00 PM	WA	1	X												
✓	D5E E11-1	8/17/11	2:00 PM	WA	1	X												
<-- Total # of Containers																		
Sample Kit Prepared By		Date/Time	Relinquished By <i>James D. Hughes</i>	Date/Time (FEE BY) 8-22-11 10:20 AM Received By <i>John H. Kippin Jr.</i>												Date/Time 08-23-11 9:41 AM		
Comments/Special Reporting Requirements			Relinquished By <i>John H. Kippin Jr.</i>	Date/Time (FEE BY) 8-23-11 11:05 AM Received By <i>Brian Murphy</i>												Date/Time 8-23-11 11:05 AM		
Cooler #'s & temps on Receipt			Relinquished By <i>John H. Kippin Jr.</i>	Date/Time (FEE BY) 8-23-11 11:05 AM Received By <i>Brian Murphy</i>												Date/Time 8-23-11 11:05 AM		
ELUTRIATES																		
SW-Surface Water DW-Wastewater SE-Sediment SW-Surface Water DW-Drinking Water SE-Groundwater SO-Soil DM-Drinking Water																		
Matrix : GM-Groundwater SO-Soil DW-Drinking Water SE-Sediment SW-Surface Water DW-Wastewater A-Air W-Water WW-Wastewater B-Bioassay C-Certified D-Dilution E-Effluent F-Filtrate G-Glass H-Human I-Industrial J-Juice K-Kitchen L-Laboratory M-Metal N-Natural O-Oil/Oilfield P-Petroleum Q-Quality R-Rain S-Sewage T-Treatment U-Urban V-Vehicle W-Water X-Xylene Y-Yeast Z-Zinc																		
Preservation: Use HCl-NHNO3 S-H2SO4 NO-NaOH O-Oil/wax (detail in comments)																		
Note : All samples submitted to ENCO Labs are in accordance with the terms and conditions listed on the reverse of this form, unless prior written agreements exist																		



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Cary, NC 27511

(919) 467-3000 Fax (919) 467-3515

Client Name **River Bank Ecosystems (R1010)** Project Number **Neuse River**
 Address **P.O. Box 29921** Project Name/Desc **Neuse River**
 City/State/Country **Austin, TX** PO # / Billing Info
 Tel **512/241-3775** Fax
 Sampler(s) Name, Affiliation (Print) **Adam Riffke**
Adam Riffke - USGS
 Sampler(s) Signature **Vincent Hughes - USGS**

		Requested Analyses						Requested Turnaround Times	
								Note : Rush requests subject to acceptance by the facility	
								<input type="checkbox"/> Standard	
								<input type="checkbox"/> Expedited	
								Due 1/1/	
								Lab Workorder C10980	
Preservation (See Codes) (Combine as necessary)									
Item #	Sample ID (Field Identification)	Collection Date	Collection Time	Comp / Grab	Matrix (see codes)	Total # of Containers	Sample Comments		
✓	S22 P	08-18-1994	2pm PT	WA	/	/			
✓	S18A P			WA	/	/			
✓	S13 P			WA	/	/			
✓	S6 P			WA	/	/			
✓	S6AP			WA	/	/			
✓	S2 P			WA	/	/			
✓	D1 P			WA	/	/			
✓	D3 P			WA	/	/			
✓	D4 P			WA	/	/			
✓	DSP	08-18-1994	2pm PT	WA	/	/			
✓	DSPW Extra	08-18-1994	2pm PT	WA	/	/			
✓	D3 PW Extra	08-18-1994	2pm PT	WA	/	/			

Sample Kit Prepared By	Date/Time	Reinstituted By	Date/Time	(F/E) Received By	Date/Time
		Jeanne Daffey	8-22-11 10:00 AM	Jeanne Daffey	08-23-11 9am
Comments		Reinstituted By		Received By	
<i>Analyst called USGS (Kerns)</i>		<i>from Adam Riffke</i>	8-23-11 11:05 AM	<i>Adam Riffke</i>	8-23-11 11:05
<i>08-23-11 to verify sample</i>		<i>date/times</i>		Received By	
<i>date/times</i>					
Cooler #'s & Temps on Receipt				Condition Upon Receipt	
C-800 4.9°C		Red	4.6°C	Blue S.O.C.	Acceptable
					Unacceptable

Matrix : GW-Groundwater SD-Soil SE-Sediment SW-Surface Water WW-Wastewater A-Air O-Othe (detail in comments)

Preservation: Hg-HgCl N-NH3O+ NH3O+ NO-NH4+ NO-NH3O+ (detail in comments)

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